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Youth depressive symptoms and changes in relationships with parents and peers

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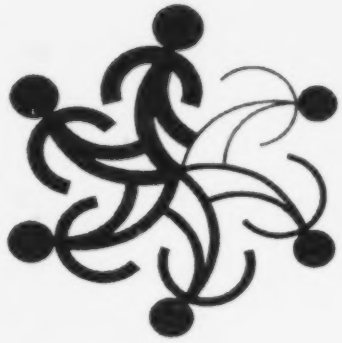

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Tracey Bushnik, *Statistics Canada*

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Table of Contents

Abstract 5

1. Objective 6

2. Background and Rationale 6

3. Methods and Procedures 7

4. Results 10

5. Discussion and conclusions 26

Endnotes 29

References 30

Appendix A. The National Longitudinal Survey of Children and Youth 33

Appendix B. Definitions and concepts 35

Appendix C. Data analysis 42

Appendix D. Tables 53

Abstract

This study used data from the National Longitudinal Survey of Children and Youth (NLSCY) to examine changes in relationships with parents and peers during adolescence, and adolescent depressive symptoms. The study found that relationships with others and depressive symptoms were linked at ages 14 and 15, and again two years later at ages 16 and 17. Youth who reported higher levels of closeness, affection and understanding from their mothers and fathers had lower depressive symptoms scores at both times in their lives. Moreover, youth who reported getting along well with their peers also had lower depressive symptoms scores. These results appeared for both genders, regardless of household income or whether youth lived in either single-parent or two-parent families. When changes in relationships with others were examined over time, the study found that change in the relationship with mother was not linked to depressive symptoms at ages 16 and 17. However, improvements in the reported relationships with fathers and friends were linked to lower depressive symptoms scores at ages 16 and 17.

1. Objective

The purpose of this report is to examine the link between changes in relationships with parents and peers during adolescence, and adolescent depressive symptoms. This report uses data from the National Longitudinal Survey of Children and Youth (NLSCY) to provide some insight into the relationships between youth and their mothers, fathers and friends, how these relationships changed over a two-year period, and how these changes related to depressive symptoms experienced at ages 16 and 17.

2. Background and Rationale

Depressive symptoms during adolescence were once thought of as a relatively common and normal aspect of adolescent development (Sheeber, Hops & Davis, 2001; Robertson & Simons, 1989). Research over the past few decades, however, has suggested that adolescent depressive symptoms may not be as benign and transitory as once believed. Instead, they can negatively affect development and functioning (Lasko & Field, 1996). Depressive symptoms during adolescence have been linked to learning difficulties and dropping out of school, substance abuse, an increased chance of a major depressive episode during adulthood, and suicide (Cornwell, 2003; Marcotte, Fotin, Potvin & Papillon, 2002; Field, Diego & Sanders, 2001, Brage & Meredith, 1994; Lasko & Field, 1996; and Robertson & Simons, 1989). Girls may be at greater risk of negative outcomes as they are more likely to report depressive symptoms during adolescence than are boys (Colarossi & Eccles, 2003; Marcotte, Fortin, Potvin & Papillon, 2002; and Avison & McAlpine, 1992).

While researchers have found that certain individual and environmental factors - such as a tendency to interpret the world with a negative bias (known as negative cognition - Ostrander, Weinfurt, & Nay, 1998) and stressful life events (Liu, 2002; and Avison & McAlpine, 1992) - are associated with depressive symptoms during adolescence, attention has also been given to the various social arenas of the individual. Relationships with parents and peers have been identified as two arenas of interest. Research has shown that both parents and peers have a significant influence on adolescent well-being (Cornwell, 2003; Field, Diego, & Sanders, 2002; Liu, 2002; and Milne & Lancaster, 2001), and there has been an observed link between high levels of support and lower levels of depression (Colarossi & Eccles, 2003; and Cornwell, 2003). Researchers have also acknowledged that the link between support and depression can be bi-directional with depressive affect influencing levels and quality of support (Colarossi & Eccles, 2000; and Buehler, Krishnakumar, Anthony, Tittsworth & Stone, 1994).

A life-course perspective of social support suggests that as life circumstances change, both individuals' social networks and their needs for different types and amounts of support also change (Colarossi & Eccles, 2003). Some studies have shown an incremental lessening of parental influence coinciding with an increase in peer influence on certain outcomes as youth move through adolescence. Adolescent psychological well-being, as measured by the prevalence of depressive symptoms, is one of these outcomes (Ostrander, Weinfurt & Nay, 1998). Few studies, however, have examined how change in relationships with parents and peers is linked with depressive symptoms. Among those who have, Cornwall (2003) found that adolescents who experienced a decay in parental or friendship support experienced higher levels of

depression on average than those who experienced static or increasing levels of support over time.

Further, there has been some evidence of gender differences in the relation between support and mental health, both from the youth perspective and the parental perspective. Specifically, mothers and fathers – as the support providers – may interact differently with male and female youth, resulting in differences in the links between the support provided and youth depressive symptoms. Colarossi & Eccles' longitudinal study in 2003 found that mother support had a larger effect than father support on youth depression, but that this effect did not differ among male and female adolescents. Further, Avison and McAlpine's 1992 cross-sectional study found some differences in the links between depressive symptoms and mother versus father support, but also found that these links were the same for both male and female youth.

The purpose of the present study was to add to the existing research by combining an analysis of change and an analysis of gender differences – parents and youth - into a single report. This study examined possible links between male and female adolescent depressive symptoms and changes in relationships with parents and peers. Specifically, this study examined adolescent relationships with mothers and fathers and friends, how these relationships changed from when the youth were 14 to 15 years old to when the youth were 16 to 17 years old, and how these changes were linked to depressive symptoms at ages 16 to 17. Whether this link was different for male versus female youth was also examined.

Research questions

To provide focus for the present study, several research questions were developed:

1) How do adolescents perceive their relationships with their mothers and their fathers? Do male and female adolescents differ in their perception of these relationships? Does this perception change and do gender differences, if any, persist over time?
2) How do adolescents perceive they get along with their peers? Do male and female adolescents differ in their perception of this relationship? Does this perception change and do gender differences, if any, persist over time?
3) Do male and female adolescents differ in the degree of their depressive symptoms at ages 16 and 17? Did a difference exist two years earlier when they were 14 and 15 years old?
4) Is there a link between relationships with others and adolescent depressive symptoms? Are changes in these relationships over time related to depressive symptoms at ages 16 and 17? Do the patterns differ for male and female adolescents?

3. Methods and Procedures

Participants

Included in this study were 908 members of the first longitudinal cohort of the National Longitudinal Survey of Children and Youth (NLSCY) who were 16 and 17 years old during the 2000/01 collection phase of the survey. These youth had also responded two years previous at the ages of 14 and 15. This sample of youth represented approximately 359,600 people who were 10 and 11 years-old in 1994/95 – the time of the first collection of the NLSCY. For more information about the NLSCY and how the sample was selected for this study, see Appendix A.

Measures

To answer the research questions outlined for this study and guided by the literature, a number of variables from the NLSCY were selected for the analysis.

Parents and friends

The relationship with mother and relationship with father variables were derived from a series of items that asked youth to evaluate the quality of their relationships with their parents across three dimensions: closeness, understanding, and affection. A high score indicated that the perceived relationship included a great deal of most or all three characteristics, and a low score indicated that the relationship was lacking in some or all three areas. Separate mother and father relationship scores were derived from the data when the youth were 14 and 15 years old in 1998/99 and again when the same youth were 16 and 17 years old in 2000/01. As change in these relationships was of key interest, two additional relationship variables were created that measured the degree to which the relationship scores reported by 14- and 15-year-olds may have increased, decreased or stayed the same by the time these youth were 16 and 17 years old.

To address peer influence, the friendship variable measured how well youth got along with their friends. A high score indicated that youth perceived good relationships with others while a low score indicated that youth felt they did not get along well with others. Friendship scores were derived from the 1998/99 and the 2000/01 data. An additional variable was created that measured how much the 1998/99 friendship score reported at ages 14 and 15 had changed (increased, decreased or stayed the same) by the time youth were 16 and 17 in 2000/01.

Demographic characteristics

The basic demographic characteristics included in the analyses were gender, age, household income ratio, and number of parents in the household. Gender allowed an examination of possible differences between male and female youth in depressive symptoms and in their relationships with others. Age permitted an examination of possible differences in 16-year-olds' and 17-year-olds' perceptions and experiences. The household income ratio, which indicated where income fell relative to the low income cut-off (LICO)[1] for a household of a given size in a given region, provided a measure of the economic condition of the household. Number of parents, namely whether the youth lived in a single- or two-parent household, accounted for those youth whose perceived parental relationship may have been with a mother or father who was absent from the household. Both the household income ratio and the number of parents in the household were measured in 1998/99 and in 2000/01.

Stressful events

Given the research evidence that stressful events are linked to adolescent depression, it was of interest to control for the possibility that the depressive symptoms score in 2000/01 may have been linked to stressful events that had been experienced by youth by the age of 16 or 17. In 2000/01, youth were asked if any of the following events had ever happened: the painful breakup with a boy/girlfriend, a serious problem at school, a pregnancy or abortion, or the death of someone close[2]. These four types of stressful events were summed and included as a single variable in the analysis, with a maximum value of 4.

Depressive symptoms

The outcome measure for this study was the depressive symptoms scale score of 16 and 17 year-olds in 2000/01. This score provided a measure of the frequency of depressive symptoms by focussing on the occurrence and severity of symptoms during the previous week. Youth were asked to respond to statements like: *I felt depressed; I felt I could not shake off the blues even with help from my family and friends*; and *I felt that everything I did was an effort*. This measure was not a diagnostic for clinical depression; instead, a high score indicated the prevalence of depressive symptoms or depressive affect.

In addition, two separate variables represented depressive symptoms at ages 14 and 15[3]. The first was whether the youth had seriously considered suicide in the previous 12 months (known as suicidal ideation); a variable that research has shown is strongly correlated with depressive affect (Field et al, 2001; and deMan & Leduc, 1993). The second variable was the youth's score on a measure of anxiety and emotional disorder (a high score indicating the presence of anxiety). Medical research has shown considerable comorbidity between anxiety and mood disorders such as depression (Bakish, D., 1999; Gorman, J., 1996-97; and Lydiard, R., 1991). As neither suicidal ideation nor anxiety was a depressive symptoms score, these two variables are referred to as proxy measures of depressive symptoms in the subsequent analyses.

Detailed information about each variable outlined above is presented in Appendix B.

Data Analysis

In this study, all variables that were measured in 1998/99 are referred to as 'Time 1' variables. All variables measured in 2000/01 are referred to as 'Time 2' variables. And as the change in relationship variables identify change between 1998/99 and 2000/01, they are referred to as measuring change from Time 1 to Time 2.

The analytical methods used in this study included descriptive statistics to provide profiles of youth, as a group and by gender. Linear regression procedures were used to identify concurrent links between relationship scores on the one hand, and depressive symptoms on the other. Sequential linear regression procedures were used to identify the relative contribution of changes in relationships with others in predicting youth depressive symptoms, while controlling for other factors. While there is an acknowledged bi-directional link between relationships and adolescent depression, the relationship variables were treated as predictors in the sequential regression analyses. More information about these data analysis procedures appears in Appendix C.

4. Results

Demographic profile

The youth in this study represented approximately 359,600 young Canadians who were 10 and 11 years old in 1994/95. By 2000/01 (Time 2), they were 16 and 17 years old. Table 1 presents the demographic profile of these youth. At Time 2, a little over half were male (51.3%), and 52.1% were 17 years old. The majority of these youth lived with both parents (85.1%) and in a household where the income was, on average, almost three times greater than the LICO. Two years previous, most of these same youth had lived with both parents (85.9%) and had a household income that was, on average, slightly less than that of 2000/01.

When compared, male and female adolescents were found to be similar across all demographic characteristics at both Time 1 and Time 2. In other words, the male and female youth included in this study were approximately the same ages, lived in households with similar incomes, and in the majority of cases, lived with both parents.

Table 1
Means and percentages (standard errors) by demographic category in 1998/99 and 2000/01, all youth and by sex

		All youth			Males			Females		
		Mean or %	(S.E.)	Population N	Mean or %	(S.E.)	Population N	Mean or %	(S.E.)	Population N
Total				359,600	51.30%	(1.92)	184,400	48.70%	(1.92)	175,300
Time 1 (1998/99)										
Household income ratio	mean value	2.4	(0.08)	359,600	2.4	(0.11)	184,400	2.5	(0.12)	175,300
Number of parents	One/other	14.1%	(1.76)	50,800	15.0% [E1]	(2.69)	27,600	13.2% [E1]	(2.43)	23,100
	Two	85.9%	(1.76)	308,900	85.0%	(2.69)	156,700	86.8%	(2.43)	152,200
Time 2 (2000/01)										
Household income ratio	mean value	2.8	(0.13)	359,600	2.9	(0.22)	184,400	2.7	(0.13)	175,300
Number of parents	One/other	14.9%	(1.81)	53,600	14.4% [E1]	(2.65)	26,600	15.4% [E1]	(2.60)	27,000
	Two	85.1%	(1.81)	306,000	85.6%	(2.65)	157,800	84.6%	(2.60)	148,300
Age	16	47.9%	(1.79)	172,100	49.9%	(2.75)	92,000	45.7%	(2.50)	80,200
	17	52.1%	(1.79)	187,500	50.1%	(2.75)	92,400	54.3%	(2.50)	95,100

Notes:

[E1] indicates a coefficient of variation (CV) between 16.6% and 25%

There are no statistically significant differences between male and female youth ($p<=0.05$)

All population N have been rounded to nearest one hundred

Source: Statistics Canada: National Longitudinal Survey of Children and Youth, 1998/99 and 2000/01

Relationships with parents, friendship scores and stressful events

All youth

As mentioned previously, the amount of closeness, understanding and affection youth perceived from each parent was combined into a separate relationship score for their mother and father. Youth's evaluation of how well they got along with their friends was incorporated into a friendship score. The means of these scores at Time 1 and Time 2, along with the changes in these scores between Time 1 and Time 2 are presented in Table 2a.

Table 2a
Means and percentages (standard errors) of relationship and friendship scores, all youth and by sex

		All youth		Males		Females	
	Possible range of values	Mean (SE)	Population N	Mean (SE)	Population N	Mean (SE)	Population N
Time 1 (1998/99)							
Relationship with mother score	0 to 6	4.3 (0.08)	359 600	4.4 (0.12)	184 400	4.3 (0.11)	175 300
Relationship with father score	0 to 6	3.7 (0.09)	359 600	**4.0** (0.13)	184 400	**3.3** (0.12)	175 300
Friendship score	0 to 16	13.5 (0.13)	359 600	**13.1** (0.20)	184 400	**13.9** (0.15)	175 300
Time 2 (2000/01)							
Relationship with mother score	0 to 6	4.5 (0.07)	359 600	4.6 (0.10)	184 400	4.5 (0.11)	175 300
Relationship with father score	0 to 6	3.7 (0.10)	359 600	**4.0** (0.14)	184 400	**3.4** (0.15)	175 300
Friendship score	0 to 16	13.6 (0.13)	359 600	13.6 (0.19)	184 400	13.6 (0.18)	175 300
Stressful events	0 to 4	1.0 (0.05)	359 600	**0.9** (0.06)	184 400	**1.1** (0.08)	175 300
		% (SE)	Population N	% (SE)	Population N	% (SE)	Population N
Change from Time 1 to Time 2							
Relationship with mother score	Increased	33.6 (2.36)	120 900	35.1 (3.44)	64 700	32.0 (3.05)	56 200
	No change	40.8 (2.59)	146 600	37.4 (3.61)	68 900	44.3 (3.37)	77 700
	Decreased	25.6 (2.22)	92 200	27.5 (2.98)	50 700	23.7 (2.89)	41 500
Relationship with father score	Increased	34.4 (2.46)	123 600	34.8 (3.85)	64 100	34.0 (3.08)	59 600
	No change	32.3 (2.38)	116 100	29.7 (3.37)	54 800	35.0 (3.47)	61 300
	Decreased	33.3 (2.72)	119 900	35.5 (3.91)	65 500	31.0 (3.48)	54 400
Friendship score	Increased	35.8 (2.52)	128 900	**40.7** (3.65)	75 000	**30.7** (3.48)	53 900
	No change	28.7 (2.22)	103 200	27.8 (3.44)	51 300	29.6 (2.95)	51 900
	Decreased	35.5 (2.34)	127 600	31.5 (3.28)	58 000	39.7 (3.47)	69 500

Notes:
Estimates in bold indicate statistically significant differences between male and female youth ($p<=0.05$)
All population N have been rounded to nearest one hundred
Source: Statistics Canada: National Longitudinal Survey of Children and Youth, 1998/99 and 2000/01

Youth rated their mothers higher than their fathers on measures of closeness, understanding and affection

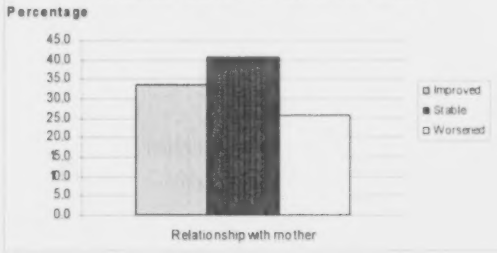
At Time 1, youth had a higher average score on the relationship with mother scale (4.3) than on the relationship with father scale (3.7). This held true at Time 2 as well (4.5 versus 3.7). Examining the individual items that comprised the scales revealed that youth consistently rated their mothers higher than their fathers on all three attributes of the relationship scales; closeness, understanding and affection.

On average, youth had similar friendship scores at Time 1 and Time 2, 13.5 and 13.6 (on a scale from 0 to 16), respectively. And youth reported having experienced, on average, one stressful event by Time 2.

Youth's reported relationship with their mother was fairly stable over time

Youth perceived some change in their relationships with their parents over time. Figure 1 presents the type of change perceived by youth in their relationships with their mother. A significantly higher proportion of youth reported that their relationship with their mother was stable (40.8%), compared to those who reported a worsening in this relationship (25.6%).

Figure 1
Youth were more likely to report stability in their relationship with their mother over time, than to report that the relationship had worsened



On the other hand, youth were as likely to report that their relationship with their father was stable, as to report it had worsened over time (Figure 2). Overall, a similar proportion of youth (33.6% and 34.4%, respectively) reported that their relationships with their mother and their father had improved from Time 1 to Time 2.

Figure 2
Youth were equally likely to report an improvement, stability or a worsening of their relationship with their father over time

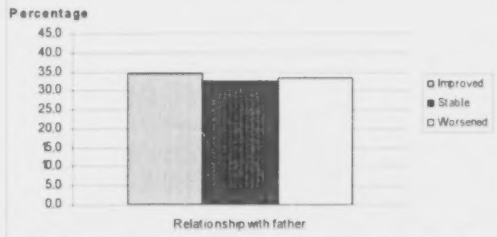
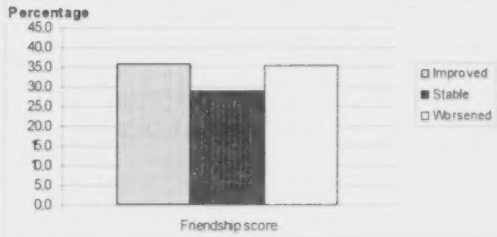


Figure 3 presents changes in friendship scores over time. By Time 2 as many youth (35.8%) reported that their friendship score had increased as those who reported that it had declined (35.5%).

Figure 3
Youth were equally likely to report an improvement, stability or a worsening of their ability to get along with their friends over time



The frequency distributions of scores for all youth on the Time 1 and Time 2 relationship and friendship scales as well as stressful events are presented in Appendix D.

Male and female comparison

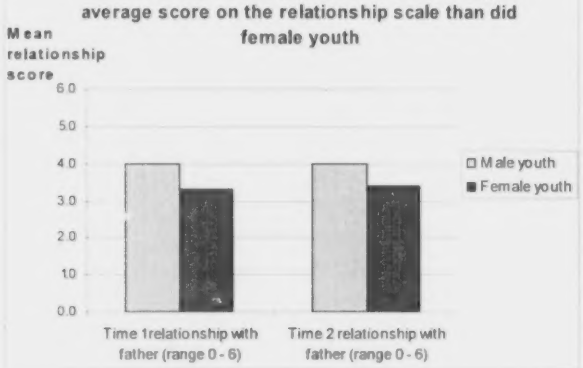
Male and female youth rated their relationship with their mother similarly

On average, male and female youth did not differ in their scores on the relationship with mother scale at either Time 1 or Time 2. This finding supports Kosterman et al (2004) who suggest that the relationships of daughters and sons with their mothers may be largely similar.

Male youth rated their fathers higher on measures of closeness, affection and understanding than did female youth

Figure 4 shows that male youth had higher scores on the relationship with father scale at Time 1 and at Time 2 than did female youth. This is consistent with Colarossi & Eccles (2003) who found that male adolescents perceive significantly more support from fathers than do female adolescents.

Figure 4
Male youth consistently gave their father a higher average score on the relationship scale than did female youth



The gender gap in friendship scores closed by the age of 16 and 17

Female youth had a higher average friendship score at Time 1 than did male youth (13.9 versus 13.1), which supports a similar finding by Colarossi & Eccles (2003). By Time 2, however, there was no difference in friendship scores for male and female youth (Figure 5).

Figure 5
By the age of 16 and 17, male and female youth reported similar average friendship scores

When change over time was examined, a single significant gender difference was found: a higher proportion of male adolescents (40.7% versus 30.7%) perceived an increase in their friendship score from Time 1 to Time 2, compared to female adolescents. Therefore, the gap in male and female perception of friendships that existed at ages 14 and 15 had closed by the time these youth were 16 and 17 years old.

On average, female youth reported experiencing more stressful events than male youth

There was a gender difference when stressful events were examined. Female youth reported a higher average number of stressful events, as of Time 2, than did males (1.1 versus 0.9).

Depressive symptoms

All youth

Table 2b presents the means and percentages of the proxy (Time 1) and scale (Time 2) depressive symptoms for all youth, and for male and female youth separately. At Time 1, youth had an average score of 3.8 on the anxiety scale (a scale that runs from 0 to 16 – higher scores

indicating higher levels of reported anxiety) and 11% of youth had seriously considered suicide in the previous 12 months. At Time 2, youth scored an average of 9.0 on the Time 2 depressive symptoms scale, a scale that runs from 0 to a high of 36 (higher scores indicating a greater prevalence of depressive symptoms).

The frequency distributions of scores on the anxiety scale at Time 1 and depressive symptoms at Time 2 are presented in Appendix D.

Table 2b
Means and percentages (standard errors) of depressive symptoms, all youth and by sex

		All youth			Males			Females		
	Possible range of values	Mean or %	(SE)	Population N	Mean or %	(SE)	Population N	Mean or %	(SE)	Population N
Time 1 (1998/99)										
Proxy measures of depressive symptoms										
Anxiety and emotional disorder	0 to 16	3.8	(0.15)	359,600	**2.9**	(0.21)	184,400	**4.7**	(0.21)	175,300
Seriously considered committing suicide	No	88.9%	(1.41)	319,800	**93.1%**	(1.87)	171,600	**84.5%**	(2.16)	148,200
	Yes	11.1%	(1.41)	39,800	**6.9%** [E2]	(1.87)	12,700	**15.5%**	(2.16)	27,100
Time 2 (2000/01)										
Depressive symptoms score	0 to 36	9.0	(0.31)	359,600	**8.3**	(0.46)	184,400	**9.9**	(0.40)	175,300

Notes:

[E2] indicates a coefficient of variation (CV) greater than 25% and less than or equal to 33.3%

Estimates in bold indicate statistically significant differences between male and female youth ($p<=0.05$)

All population N have been rounded to nearest one hundred

Source: Statistics Canada: National Longitudinal Survey of Children and Youth, 1998/99 and 2000/01

Male and female comparison

Female youth consistently reported more depressive symptoms than did male youth

Male and female youth differed significantly in the prevalence of depressive symptoms. At Time 1, female youth reported significantly higher average levels of anxiety (4.7 versus 2.9) than did males, and more female youth reported having considered suicide in the 12 months preceding Time 1 than did male youth (15.5% versus 6.9%). At Time 2, female youth had a significantly higher mean depressive symptoms score (9.9) than did male youth (8.3). These findings are consistent with other studies that have found that girls report more depressive symptoms during adolescence (Colarossi & Eccles, 2003; Marcotte, Fortin, Potvin & Papillon, 2002; and Avison & McAlpine, 1992).

Correlations among variables

To help understand how depressive symptoms, relationships with parents and friends, demographic characteristics and stressful events may have been interrelated, correlations among all variables were produced. Table 3 presents these zero-order correlations.

Relationship and friendship scores were negatively correlated with depressive symptoms

Links between depressive symptoms and the relationship and friendship scores were evident. Time 1 anxiety was negatively correlated with the relationship with mother, father and friendship scores from Time 1. Further, Time 2 depressive symptoms were negatively correlated with the Time 1 and Time 2 relationship and friendship scores. In other words, in Time 1 and in Time 2 an increase in a relationship score produced a corresponding decrease in the depressive symptoms score, and vice versa.

Except for gender, demographic characteristics were not correlated with depressive symptoms at age 16 and 17

Time 2 depressive symptoms were positively correlated with Time 1 anxiety and suicidal ideation, as well as with stressful events and gender. Time 2 depressive symptoms were not, however, correlated with age, household income, single versus two-parent status, or the change in relationship or change in friendship scores.

Table 3
Zero-order correlations

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1 Sex (male/female)																		
2 Age (14/15)	0.04																	
3 Time 1 relationship with mother	-0.04	-0.09																
4 Time 1 relationship with father	**-0.18**	-0.06	**0.48**															
5 Time 2 relationship with mother	-0.03	-0.07	**0.56**	**0.28**														
6 Time 2 relationship with father	**-0.14**	-0.05	**0.31**	**0.60**	**0.40**													
7 Change in relationship with mother (↑, no change, ↓)	-0.01	-0.01	**0.40**	**0.21**	**-0.43**	-0.08												
8 Change in relationship with father (↑, no change, ↓)	-0.02	0.02	**0.12**	**0.32**	**-0.20**	**-0.47**	**0.35**											
9 Time 1 friendship score	**0.15**	0.07	**0.16**	**0.17**	0.11	**0.15**	0.05	0.00										
10 Time 2 friendship score	0.00	0.05	**0.13**	**0.16**	0.07	**0.17**	0.06	-0.03	**0.54**									
11 Change in friendship score (↑, no change, ↓)	**0.11**	-0.04	0.02	0.01	-0.01	-0.03	0.02	0.05	**0.31**	**-0.48**								
12 Time 1 household income ratio	0.01	**-0.11**	0.10	0.02	0.04	0.08	0.07	**-0.13**	0.04	-0.03	**0.11**							
13 Time 2 household income ratio	-0.03	0.05	0.03	0.00	0.09	**0.14**	-0.06	**-0.15**	0.08	0.04	0.04	**0.61**						
14 Time 1 number of parents (one/two)	0.03	-0.04	**0.13**	**0.17**	0.06	**0.19**	0.09	-0.02	0.05	0.03	0.02	**0.22**	**0.20**					
15 Time 2 number of parents (one/two)	-0.01	-0.06	**0.14**	**0.19**	0.04	**0.21**	0.09	-0.02	0.03	0.05	-0.01	**0.23**	**0.22**	**0.79**				
16 Time 2 stressful events	**0.14**	**0.13**	-0.08	-0.09	-0.09	-0.09	0.02	0.00	0.00	-0.02	-0.01	-0.09	-0.07	-0.06	0.09			
17 Time 1 anxiety	**0.30**	0.01	**-0.25**	**-0.27**	**-0.13**	**-0.14**	-0.10	-0.08	**-0.35**	**-0.25**	-0.07	-0.03	-0.07	0.02	-0.01	**0.21**		
18 Time 1 suicidal ideation (no/yes)	**0.14**	-0.04	**-0.19**	**-0.15**	-0.07	**-0.15**	-0.10	0.01	**-0.13**	**-0.17**	0.03	-0.08	-0.07	-0.10	-0.09	**0.26**	**0.35**	
19 Time 2 depressive symptoms	**0.13**	-0.02	**-0.25**	**-0.20**	**-0.22**	**-0.27**	-0.03	0.09	**-0.32**	**-0.38**	0.08	-0.01	0.00	0.00	0.05	**0.31**	**0.49**	**0.36**

Notes:
Estimates in bold indicate statistical significance at p <= .001
Source: Statistics Canada, National Longitudinal Survey of Children and Youth, 1998/99 and 2000/01

Depressive symptoms and relationships with others

The correlations discussed above suggested certain links between variables, particularly between the relationship and depressive symptoms scores. To determine if these links persisted under more rigorous examination, linear regression was used to evaluate how well the relationship and friendship scores in one time period were related depressive symptoms in the same time period, after controlling for demographic characteristics. The results of these regressions for Time 1 appear in Tables 4a-4c, and in Tables 5a-5c for Time 2.

Time 1

In the first regression (Table 4a), Time 1 anxiety[4] was regressed on the Time 1 relationship with mother score, followed by the demographic characteristics gender, age, household income ratio and single- versus two-parent household. An interaction between gender and relationship with mother was also added to the model to investigate possible gender differences in the link between anxiety and the relationship with mother score. Time 1 anxiety was also regressed on the Time 1 relationship with father variable (Table 4b), and on the Time 1 friendship score (Table 4c), while controlling for demographic characteristics and an interaction term.

Higher scores on the relationship and friendship scales were linked to lower levels of anxiety

In all three models, the relationship/friendship score was significantly linked with the anxiety score, having taken into account the other characteristics. Specifically, higher scores on the relationship with mother scale, the relationship with father scale, and the friendship scale were all significantly related to lower levels of anxiety at Time 1. As for the demographic characteristics, while age, income and single- versus two-parent household were not significantly related to anxiety, gender was. In all models, being male rather than female was related to significantly lower anxiety levels.

No gender difference in the link between the relationship/friendship scores and anxiety

The gender*relationship/friendship interaction term was added to each of the three models as a final step. In all three models, the interaction term was not significantly related to anxiety. This suggested that the link between the relationship/friendship score and anxiety did not differ between male and female youth.

Table 4a
Time 1 anxiety regressed on Time 1 relationship with mother and demographic variables

R^2	0.063		0.148		0.151	
	B	standard error	B	standard error	B	standard error
Time 1 (1998/99)						
Relationship with mother	**-0.495** ***	0.111	**-0.482** ***	0.099	**-0.577** ***	0.129
Sex (male/female)			**-1.801** ***	0.285	**-2.619** **	0.850
Age (14/15)			0.179	0.312	0.137	0.306
Household income ratio			-0.056	0.091	-0.055	0.090
Number of parents (one/two)			-0.424	0.393	-0.431	0.391
Interaction						
Sex (male/female) * relationship with mother					0.190	0.183

Notes:
** indicates that the coefficient differs from 0 at $p < .01$
*** indicates that the coefficient differs from 0 at $p < .001$
B = unstandardized regression coefficient
Source: Statistics Canada: National Longitudinal Survey of Children and Youth, 1998/99

Table 4b
Time 1 anxiety regressed on Time 1 relationship with father and demographic variables

R^2	0.070		0.139		0.140	
	B	standard error	B	standard error	B	standard error
Time 1 (1998/99)						
Relationship with father	**-0.468** ***	0.081	**-0.405** ***	0.078	**-0.341** **	0.118
Sex (male/female)			**-1.600** ***	0.303	-1.137	0.612
Age (14/15)			0.144	0.320	0.168	0.320
Household income ratio			-0.106	0.093	-0.113	0.095
Number of parents (one/two)			-0.544	0.374	-0.551	0.376
Interaction						
Sex (male/female) * relationship with father					-0.127	0.145

Notes:
** indicates that the coefficient differs from 0 at $p < .01$
*** indicates that the coefficient differs from 0 at $p < .001$
B = unstandardized regression coefficient
Source: Statistics Canada: National Longitudinal Survey of Children and Youth, 1998/99

Table 4c
Time 1 anxiety regressed on Time 1 friendship score and demographic variables

R^2	0.123		0.249		0.250	
	B	standard error	B	standard error	B	standard error
Time 1 (1998/99)						
Friendship score	**-0.438** ***	0.060	**-0.506** ***	0.058	**-0.454** ***	0.102
Sex (male/female)			**-2.232** ***	0.266	-1.097	1.721
Age (14/15)			-0.096	0.277	-0.093	0.276
Household income ratio			-0.061	0.096	-0.064	0.095
Number of parents (one/two)			-0.331	0.336	-0.325	0.336
Interaction						
Sex (male/female) * friendship score					-0.084	0.119

Notes:
*** indicates that the coefficient differs from 0 at $p < .001$
B = unstandardized regression coefficient
Source: Statistics Canada: National Longitudinal Survey of Children and Youth, 1998/99

Time 2

The Time 2 depressive symptoms score was regressed on the Time 2 relationship and friendship scores, while again controlling for the demographic characteristics gender, age, household income ratio and single- versus two-parent household, and including an interaction term[5].

Higher scores on the relationship with mother and friendship scales were linked to lower depressive symptoms for male and female youth

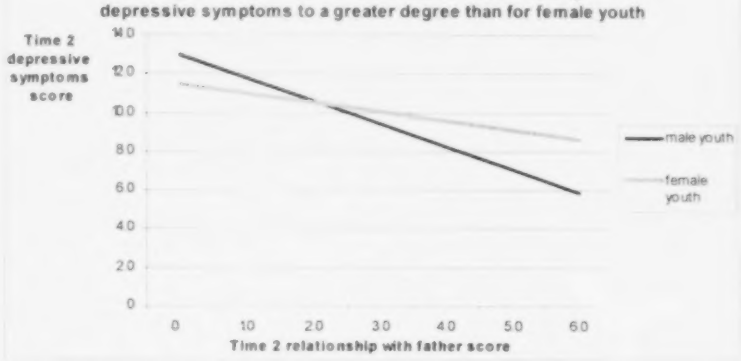
Higher relationship with mother scores at Time 2 (Table 5a) and higher friendship scores at Time 2 (Table 5c) were linked with lower depressive symptoms scores at Time 2. This held true while controlling for demographic characteristics. Further, in both regressions being male rather than female was related to significantly lower depressive symptoms scores. The interaction terms, however, were not significant in either regression. This suggested that the link between the relationship with mother/friendship score and depressive symptoms did not differ between male and female youth.

Higher scores on the relationship with father scale reduced male youth's depressive symptoms to a greater extent than for female youth

In contrast, when the Time 2 depressive symptoms score was regressed on the relationship with father score, demographic characteristics and an interaction term, the interaction term was significant. Table 5b presents the results for these regressions. As can be seen in the two final steps, not only were higher relationship with father scores linked with lower depressive symptoms scores, but the interaction between gender of the adolescent and the relationship with father variable was also significant. This suggested that the link between the relationship with father score and depressive symptoms was different for male and female youth.

Figure 6 shows a plot of the final regression results from Table 5b. The lines illustrate the gender differences in depressive symptoms according to the relationship with father score. While the negative slopes for both male and female youth indicate that the r elationship with father was important for both sexes, the steeper line for male youth suggests that a stronger relationship with their father reduced male youth's depressive symptoms to a greater extent than it did for female youth. Notably, at the higher scores on the relationship with father scale, the depressive symptoms scores were lower for male youth than for female youth.

Figure 6
A stronger relationship with their father reduced male youth's depressive symptoms to a greater degree than for female youth



Age, household income and number of parents were not linked to depressive symptoms

In the three regressions discussed above age, household income, and the number of parents in the household in Time 2 were not significantly related to depressive symptoms scores in Time 2. Given the similar results for Time 1, these variables were excluded from any further analyses.

Table 5a
Time 2 depressive symptoms regressed on Time 2 relationship with mother and demographic variables

R^2	0.050		0.070		0.071	
	B	standard error	B	standard error	B	standard error
Time 2 (2000/01)						
Relationship with mother	**-0.910** ***	0.194	**-0.916** ***	0.204	**-0.803** ***	0.226
Sex (male/female)			**-1.553** *	0.603	-0.442	1.914
Age (16/17)			0.587	0.598	0.611	0.600
Household income ratio			0.112	0.208	0.112	0.208
Number of parents (one/two)			0.795	0.905	0.808	0.906
Interaction						
Sex (male/female) * relationship with mother					-0.245	0.401

Notes:
* indicates that the coefficient differs from 0 at $p < .05$
*** indicates that the coefficient differs from 0 at $p < .001$
B = unstandardized regression coefficient
Source: Statistics Canada. National Longitudinal Survey of Children and Youth, 2000/01

Table 5b
Time 2 depressive symptoms regressed on Time 2 relationship with father and demographic variables

R^2	0.072		0.084		0.097		0.093 [1]	
	B	standard error	B	standard error	B	standard error	B	standard error
Time 2 (2000/01)								
Relationship with father	**-0.853** ***	0.154	**-0.832** ***	0.167	**-0.482** *	0.208	**-0.466** *	0.199
Sex (male/female)			-1.177	0.622	1.541	1.489	1.513	1.458
Age (16/17)			0.507	0.603	0.571	0.600		
Household income ratio			0.131	0.204	0.133	0.206		
Number of parents (one/two)			0.075	0.785	0.068	0.772		
Interaction								
Sex (male/female) * relationship with father					**-0.737** *	0.319	**-0.722** *	0.311

Notes:
* indicates that the coefficient differs from 0 at $p < .05$
*** indicates that the coefficient differs from 0 at $p < .001$
B = unstandardized regression coefficient
[1] This final model includes only the interaction term and the main effects of sex and relationship with father, as all other variables were not significant at the 0.05 level.
Source: Statistics Canada: National Longitudinal Survey of Children and Youth, 2000/01

Table 5c
Time 2 depressive symptoms regressed on Time 2 friendship score and demographic variables

R^2	0.143		0.162		0.162	
	B	standard error	B	standard error	B	standard error
Time 2 (2000/01)						
Friendship score	**-0.869** ***	0.117	**-0.866** ***	0.119	**-0.860** ***	0.163
Sex (male/female)			**-1.605** **	0.586	-1.436	3.256
Age (16/17)			0.153	0.583	0.149	0.575
Household income ratio			0.081	0.186	0.082	0.187
Number of parents (one/two)			-0.590	0.757	-0.592	0.763
Interaction						
Sex (male/female) * friendship score					-0.012	0.239

Notes:
** indicates that coefficient differs from 0 at $p < .01$
*** indicates that coefficient differs from 0 at $p < .001$
B = unstandardized regression coefficient
Source: Statistics Canada: National Longitudinal Survey of Children and Youth, 2000/01

Depressive symptoms and changes in relationships with others

The main purpose of this study was to examine the link between youth depressive symptoms at ages 16 and 17 and *changes* in relationships with mother and father and friendship scores over time. To this end, sequential linear regression was used. Separate regressions were run to study the effects of change in the relationship with mother, change in the relationship with father, and change in friendship score, while controlling for other factors. Guided by the examination of the correlations in Table 3 and the regression results described in the previous section, the following factors were controlled: gender, the relationship/friendship score at Time 1, proxy depressive symptoms at Time 1, and stressful events. In addition, to investigate possible gender differences in the link between the changes in relationship/friendship scores and depressive symptoms, an interaction between gender and the change in relationship/friendship score was added to each model.

The variables were loaded into each regression in the same order. Given the interest in differences between male and female youth, gender was loaded in the first step of each regression. The next step loaded the change in relationship or friendship variable while controlling for the Time 1 relationship/friendship score. The third step loaded the proxy depressive symptoms from Time 1. The fourth step controlled for stressful events as of Time 2. The final step loaded the interaction term. Results of these regressions appear in Tables 6a, 6b and 6c.

Change in relationship with mother

Change in relationship with mother was not linked to depressive symptoms

The results presented in Table 6a reveal that, having controlled for other factors, change in the relationship with mother from Time 1 to Time 2 was not linked to depressive symptoms at Time 2. This suggested that youth's depressive symptoms at ages 16 to 17 were not related to the perceived change in the amount of closeness, understanding and affection youth received from their mother.

Further, neither gender nor the variable representing the interaction between gender and change in relationship with mother was linked to Time 2 depressive symptoms. This suggested that once other factors are controlled, there was little evidence of gender differences in depressive symptoms at ages 16-17.

All the remaining variables were significant predictors of Time 2 depression. The Time 1 proxies for depressive symptoms were each significant and contributed much explanatory power to the model (R^2 increased from .086 to .299 with the addition of these two variables). The results suggested that the greater the prevalence of proxy depressive symptoms at Time 1, the higher the predicted depressive symptoms score at Time 2. Stressful events were also significant in that an increased number of stressful events predicted an increase in the depressive symptoms score. And lastly, the Time 1 relationship with mother score was significant as youth who scored higher at age 14 and 15 had lower predicted depressive symptoms scores by the age of 16 and 17.

Table 6a
Relationship and change in relationship with mother as predictors of Time 2 youth depressive symptoms

	Step 1		Step 2		Step 3		Step 4		Step 5	
R^2	0.017		0.086		0.299		0.329		0.330	
	B	standard error	B	standard error	B	standard error	B	standard error	B	standard error
Predictors										
Sex (male/female)	**-1.591** **	0.604	**-1.427** *	0.587	0.268	0.546	0.426	0.531	0.540	0.941
Time 1 relationship with mother			**-1.119** ***	0.239	**-0.662** ***	0.188	**-0.624** **	0.191	**-0.626** ***	0.189
Time 1 to Time 2 change in relationship with mother										
(increase/decrease)			-1.412	0.817	-1.602	0.725	-1.382	0.718	-1.097	0.915
(no change/decrease)			-0.425	0.727	-0.338	0.598	-0.309	0.574	-0.370	0.802
Time 1 anxiety					**0.754** ***	0.099	**0.714** ***	0.097	**0.712** ***	0.097
Time 1 suicidal ideation (no/yes)					**-3.954** ***	1.006	**-3.218** **	0.988	**-3.209** **	1.012
Stressful events (as of time 2)							**1.177** ***	0.242	**1.184** ***	0.243
Interaction										
Sex (male/female) * change in relationship with mother (↑, no change, ↓)										not significant p= .84

Notes:
* indicates that the coefficient differs from 0 at $p < .05$
** indicates that the coefficient differs from 0 at $p < .01$
*** indicates that the coefficient differs from 0 at $p < .001$
B = unstandardized regression coefficient
Source: Statistics Canada. National Longitudinal Survey of Children and Youth, 1998/99 and 2000/01

Change in relationship with father and in friendship scores

Improvement or stability in the relationship with father and friendship scores were each linked to lower depressive symptoms at age 16 and 17, for both male and female youth

The change in the relationship with father variable (Table 6b) and the change in friendship score (Table 6c) each significantly predicted youth depressive symptoms at Time 2, having controlled for gender, the Time 1 relationship/friendship score, Time 1 proxy depressive symptoms, and stressful events. Youth whose relationship with father improved or remained stable from Time 1 to Time 2 had lower predicted depressive symptoms scores at Time 2 than did youth whose relationship with father score worsened over the same period. The same pattern held true when the effects of a change in friendship score were examined.

In each model, the Time 1 proxies for depressive symptoms were significant predictors of depressive symptoms at Time 2, as were stressful events and the Time 1 relationship/friendship score. However, adding an interaction between youth's gender and the change in relationship/friendship variable contributed little to the explanatory power of either model, as the interaction terms were not significant. This suggested that having controlled for other factors,

the link between a change in relationship/friendship and depressive symptoms did not differ between male and female youth.

As none of the interactions between gender and change in relationship/friendship scores were significant, they were excluded from any further analyses.

Table 6b
Relationship and change in relationship with father as predictors of Time 2 youth depressive symptoms

	Step 1		Step 2		Step 3		Step 4		Step 5	
R^2	0.017		0.077		0.305		0.337		0.340	
	B	standard error	B	standard error	B	standard error	B	standard error	B	standard error
Predictors										
Sex (male/female)	**-1.591** **	0.604	-1.110	0.620	0.435	0.544	0.590	0.523	1.422	0.945
Time 1 relationship with father			**-0.820** ***	0.176	**-0.421** **	0.148	**-0.403** **	0.142	**-0.422** **	0.143
Time 1 to Time 2 change in relationship with father										
(increase/decrease)			**-2.545** ***	0.760	**-2.413** ***	0.565	**-2.371** ***	0.553	**-1.576** *	0.806
(no change/decrease)			-1.367	0.754	**-1.224** *	0.588	**-1.360** *	0.569	-0.864	0.836
Time 1 anxiety					**0.790** ***	0.096	**0.748** ***	0.094	**0.746** ***	0.094
Time 1 suicidal ideation (no/yes)					**-3.803** ***	0.924	**-3.055** ***	0.914	**-2.990** ***	0.907
Stressful events (as of time 2)							**1.215** ***	0.252	**1.199** ***	0.256
Interaction										
Sex (male/female) * change in relationship with father (↑, no change, ↓)										not significant p= .44

Notes:
* indicates that the coefficient differs from 0 at $p < .05$
** indicates that the coefficient differs from 0 at $p < .01$
*** indicates that the coefficient differs from 0 at $p < .001$
B = unstandardized regression coefficient
Source: Statistics Canada: National Longitudinal Survey of Children and Youth, 1998/99 and 2000/01

Table 6c
Friendship and change in friendship scores as predictors of Time 2 youth depressive symptoms

	Step 1		Step 2		Step 3		Step 4		Step 5	
R^2	0.017		0.174		0.334		0.373		0.376	
	B	standard error	B	standard error	B	standard error	B	standard error	B	standard error
Predictors										
Sex (male/female)	**-1.591** **	0.604	**-2.022** ***	0.527	-0.189	0.517	-0.046	0.497	0.148	0.720
Time 1 friendship score			**-0.857** ***	0.135	**-0.451** ***	0.102	**-0.495** ***	0.094	**-0.476** ***	0.097
Time 1 to Time 2 change in friendship score										
(increase/decrease)			**-2.544** ***	0.744	**-2.285** ***	0.608	**-2.384** ***	0.575	**-2.603** ***	0.765
(no change/decrease)			**-2.712** ***	0.558	**-2.438** ***	0.524	**-2.459** ***	0.518	**-1.955** **	0.759
Time 1 anxiety					**0.652** ***	0.097	**0.592** ***	0.093	**0.602** ***	0.093
Time 1 suicidal ideation (no/yes)					**-3.946** ***	0.944	**-3.112** ***	0.933	**-3.057** ***	0.930
Stressful events (as of time 2)							**1.338** ***	0.236	**1.330** ***	0.238
Interaction										
Sex (male/female) * change in friendship score (↑, no change, ↓)									not significant p=.40	

Notes:
** indicates that the coefficient differs from 0 at $p < .01$
*** indicates that the coefficient differs from 0 at $p < .001$
B = unstandardized regression coefficient
Source: Statistics Canada: National Longitudinal Survey of Children and Youth, 1998/99 and 2000/01

Changes in relationship with mother, with father and in friendship scores

As young people age, their sphere of influence may shift (Colarossi, 2000). While parents may continue to play a strong role, at some point during adolescence friends may start to play a greater role (Ostrander et al, 1998). To investigate whether the predictive power of changes in relationships with parents was affected by changes in how well youth perceived they got along with their friends - or vice versa - all variables were loaded into a final model. The results are presented in Table 7.

Taken together, changes in relationship with father and in friendship scores were still linked to depressive symptoms

Having controlled for other factors, change in the relationship with mother still did not significantly predict depressive symptoms scores at Time 2. However, youth whose perceived relationship with father had improved from Time 1 to Time 2 had lower predicted depressive symptoms scores at Time 2 than did youth whose relationship with their father had worsened over the same period. Moreover, youth whose friendship score had increased or remained stable over time had lower predicted depressive symptoms scores at Time 2 than did those whose friendship score declined from Time 1 to Time 2. Of the remaining variables, Time 1 proxy depressive symptoms, stressful events, and the Time 1 relationship with mother and friendship scores still predicted depressive symptoms at Time 2.

The final model accounted for 40% of the variance in the Time 2 depressive symptoms score.

Table 7
Changes in relationships and friendships as predictors of Time 2 youth depressive symptoms

R^2	0.402	
	B	standard error
Predictors		
Sex (male/female)	0.064	0.508
Time 1 to Time 2 change in relationship with mother		
(increase/decrease)	-0.604	0.729
(no change/decrease)	0.347	0.618
Time 1 relationship with mother	**-0.499** *	0.200
Time 1 to Time 2 change in relationship with father		
(increase/decrease)	**-1.872** **	0.631
(no change/decrease)	-1.040	0.600
Time 1 relationship with father	-0.146	0.163
Time 1 to Time 2 change in friendship score		
(increase/decrease)	**-2.222** ***	0.595
(no change/decrease)	**-2.415** ***	0.532
Time 1 friendship score	**-0.445** ***	0.099
Time 1 anxiety	**0.570** ***	0.089
Time 1 suicidal ideation (no/yes)	**-2.865** **	0.893
Stressful events (as of time 2)	**1.288** ***	0.244

Notes:
* indicates that the coefficient differs from 0 at $p < .05$
** indicates that the coefficient differs from 0 at $p < .01$
*** indicates that the coefficient differs from 0 at $p < .001$
B = unstandardized regression coefficient
Source: Statistics Canada: National Longitudinal Survey of Children and Youth, 1998/99 and 2000/01

5. Discussion and conclusions

In answer to the first research question, youth on average perceived more closeness, understanding, and affection in their relationship with their mother than with their father. This was true when youth were 14 and 15 years old, and again when they were 16 and 17. This finding is consistent with research that suggests that mother-adolescent relationships are characterized by attachment and intimacy whereas father-adolescent relationships are characterized by physical and emotional distance (Sim, 2003). Further, a higher proportion of youth reported stability in their relationship with their mother over the two-year period compared to those who reported a worsening of the relationship. However, there was no difference in the proportion of youth who reported that their relationship with their father had worsened or stayed the same.

When results for male and female youth were examined separately, male youth perceived more closeness, understanding and affection from their father at both points in time than did female youth. This is consistent with Colarossi & Eccles' (2003) similar finding that male youth perceive more support from their fathers than do female youth. Male and female youth, however, did not differ in their perception of their relationship with their mother which supports Kosterman et al's (2004) suggestion that the relationships of sons and daughters with their mother may be largely similar. With respect to change in these relationships, male youth were no more or less likely to report an improvement or worsening of their relationships with their parents than were female youth.

The second research question focused on how well youth got along with peers. On average, youth reported getting along as well with their peers at ages 14 and 15 as they did two years later at 16 and 17. Further, the same proportion of youth reported that their friendship score had increased over time as those who reported that it declined. Female youth reported higher scores on the friendship scale at ages 14 and 15 than did male youth. However, a higher proportion of male youth than female youth reported an increase in their friendship score over time, thus closing the gender gap in friendship scores by the age of 16 and 17.

In answer to the third research question, 16- and 17-year-old female adolescents had a higher mean depressive symptoms score than did 16- and 17- year-old male adolescents. There was also evidence that compared to male youth, female youth were significantly more likely to display depressive symptoms two years previous. At 14 and 15 years old, female youth had higher levels of anxiety and an increased likelihood of suicidal ideation. This is consistent with other studies that have found girls more likely to report depressive symptoms during adolescence than boys (Colarossi & Eccles, 2003; Marcotte, Fortin, Potvin & Papillon, 2002; and Avison & McAlpine, 1992).

To answer the fourth research question the concurrent link between relationships and depressive symptoms at ages 14 and 15 and at ages 16 and 17 were examined. The results revealed that relationships with others were associated with adolescent depressive symptoms at both time periods, having taking into account gender, age, income, and single- versus two-parent households. Examining this link over time revealed that changes in relationships with fathers and friends were significant predictors of adolescent depressive symptoms, after taking into

account gender, the relationship scores and depressive symptomatology at age 14 and 15, and stressful events. Further, the results suggested that the links between changes in perceived relationships and depressive symptoms were equally important across male and female youth. This lack of gender difference in depressive symptoms once other factors were controlled is consistent with the findings of some studies (Brage et al, 1994; and Colarossi et al, 2003).

Change in the perceived relationship with mother over time was not linked to depressive symptoms at age 16 and 17. This suggests that youth's depressive symptoms were not related to the perceived change in the amount of closeness, understanding and affection youth received from their mother. It is possible that the degree of stability in the relationship with mother – 41% of youth reported no change over time – was a contributing factor to why change was not significantly related to depressive symptoms at age 16 and 17. However, it is worth noting that youth's perceived relationship with mother at age 14 and 15 was a significant predictor of depressive symptoms two years later. Specifically, youth who reported higher scores on the relationship with mother scale at ages 14 and 15 had lower predicted depressive symptoms scores by the ages of 16 and 17.

On the other hand, change in the relationship with father was significantly related to depressive symptoms. Youth who reported that their relationship with their father had increased in closeness, understanding and affection over time were more likely to have lower predicted depressive symptoms scores at ages 16 and 17 (compared to youth who reported a worsening of their relationship), regardless of how they rated their relationship with their father when they were 14 and 15 years old.

These differential results for mothers and fathers support the idea that youth may interact differently with each parent. This suggests that to better understand relationships between youth and their parents, it is important to examine mothers and fathers separately rather than regarding them as a single parenting unit (Colarossi et al, 2003).

How well youth got along with their peers proved to be important in two ways. First, after controlling for other factors, youth whose friendship score had improved or remained stable over time were more likely to have lower predicted depressive symptoms scores than those whose friendships score had declined. Second, taking into account change over time, youth who scored high on the friendship scale at 14 and 15 years old also had lower predicted depressive symptoms scores by the ages of 16 and 17. These findings suggest that youth's mental well-being and the perceived success of getting along with friends were closely linked.

The relevance of all three relationships – mothers, fathers and friends – suggests that the sphere of influence for these youth had not completely shifted from parents to peers. This is consistent with studies that have found that while parental influence may lessen throughout adolescence, it does not disappear (Furman & Buhrmester, 1992).

And while changes in relationships with others may influence youth's mental well-being, it is important to acknowledge that the reverse may also be true. Although an improvement in a relationship with a father or friend may help an adolescent through a period of depressive emotions, experiencing these emotions may affect an adolescent's relationships with others. Or

alternatively, another factor altogether could be underlying the link between relationships and mental health.

Allowing for these possibilities, this longitudinal study has attempted to shed some light on the connection between changes in relationships over time and adolescent mental well-being. While not attempting to establish causality, the analysis confirms previous research that has found that positive relationships with others can positively influence adolescent mental well-being by lessening the prevalence of depressive symptoms. And if the lessening of adolescent depressive symptoms reduces the risk of negative outcomes like problems at school, substance use, or suicidal ideation, then good relationships with others could be quite important for youth.

Endnotes

1. Every year Statistics Canada establishes what are known as the low-income cut-offs, which are derived by considering expenditure to income patterns observed in the most recent Survey of Household Spending. These thresholds or values are calculated for different urban-size and family-size categories and are updated annually using the Consumer Price Index.

2. Respondents had also been asked whether they had been through the separation or divorce of their parents. This item was not included in the 'stressful events' variable for two reasons. First, the separation/divorce item had a high level of non-response which, had it been added, would have resulted in a significant loss of respondents to the analysis. Second, a five item 'stressful events' variable was tested in the final model and when compared to the four item variable, negligible differences in the beta coefficient and its significance were observed.

3. In the NLSCY, 14 and 15 year-olds were not asked the depressive symptoms scale questions.

4. As suicidal ideation was the second proxy of depressive symptoms at Time 1, logistic regression was used to regress Time 1 suicidal ideation on the relationship and friendship scores at Time 1. Though not presented in the report, the results indicated that higher scores on the relationship with mother, father and friendship scales reduced the likelihood of having suicidal thoughts.

5. In the interest of comparability with the Time 1 analysis, stressful events were not added as a variable in the Time 2 regressions in this section.

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Appendices

Appendix A. The National Longitudinal Survey of Children and Youth

Survey objectives

The National Longitudinal Survey of Children and Youth (NLSCY) is a long-term study of Canadian children that follows their development from birth to early adulthood. The NLSCY began in 1994 and is jointly conducted by Statistics Canada and Human Resources Development Canada (now Social Development Canada). The survey is designed to collect information about factors influencing the social, emotional and behavioural development of children, and to monitor the impact of these factors on their development over time. The survey covers a broad range of topics including health, physical development, learning, behaviour, and social environment (family, friends, schools and communities).

Survey design

The NLSCY sample frame in the first cycle of the survey, in 1994/95, was based on the Labour Force Survey (LFS), a monthly survey of households in Canada conducted by Statistics Canada. Households with children aged 0 to 11 years old were selected from the LFS in 1994 to participate in the NLSCY. Of 26,000 eligible households, 23,000 responded.

The first cycle of the NLSCY was conducted in 1994 and early 1995. The longitudinal cohort from that cycle has been monitored every two years since then, with data collection taking place in 1994/95, 1996/97, 1998/99, 2000/01, and 2002/03. New panels of children have been added to the survey each year, but the present study was based on the original longitudinal panel. Data were available for Cycles 1 to 4 at the time of writing. Data from the fifth cycle (2002/03) will be available in early 2005.

For children under 16 years of age, most of the information in the survey is provided by the person most knowledgeable about the child (the PMK), usually the mother. She provides information about herself, the household and family, and the child. In addition, children 10 and over provide some information about themselves on a self-completed questionnaire. Direct measures of the child's abilities may also be taken, depending on the child's age. School teachers and principals also complete a survey, again depending on the age and school status of the child, and on whether permission is given by the parent.

The present sample

The youth studied here were members of the first longitudinal cohort of the NLSCY. The sub-group of interest were 16 and 17 years old during the 2000/01 collection of Cycle 4 and were introduced into the survey in Cycle 1 (1994/95) at the ages of 10 and 11[1]. Though all 16 and 17 year-old in-scope Cycle 4 respondents who had been introduced in Cycle 1 were of interest, due

1. Two percent of 16- and 17-year-olds in Cycle 4 had been 9 years old in Cycle 1, the rest had been 10 or 11 years old.

to attrition and partial non-response fewer respondents were available for analysis. Table A1 presents the breakdown of response for youth included in the study.

Table A1
Breakdown of response for youth 16-17 years old included in the study

Total number of 16-17-year-olds in scope for Cycle 4	**2,249**
less non-respondents in Cycle 4	-394
Total number of 16-17 year old respondents in Cycle 4	**1,855**
less partial non-respondents (missing a response to a variable of interest to the analysis)	-894
less Cycle 3 non-respondents (did not respond at all in Cycle 3)	-53
Total number of 16-17 year old respondents included in this study	**908**

Source: Statistics Canada: National Longitudinal Survey of Children and Youth, 1998/99 and 2000/01

To begin, all 1,855 respondents who were 16-17 years old in Cycle 4 were selected for inclusion in the study. Applying the survey design weight[2] indicates that these 1,855 youth represented 762,300 youth of similar age in the Canadian population. The analyses in this report were undertaken on those youth for whom data were available on all of the variables of interest. A total of 947 youth (894+53), representing 402,600 youth in the Canadian population, were excluded from the analyses because data were not available for at least one of the variables. The remaining sample of 908 respondents represented 359,600 youth in the Canadian population. While the majority of these respondents came from separate households, thirteen households contained two youth of the appropriate age, and both youth were retained in the analyses.

A partial non-response analysis was undertaken for the variables of interest, to guide the interpretation of findings and to investigate whether any bias was introduced by the exclusion of the partial non-respondents. The non-response analysis appears in Appendix C.

2. The survey design weight used for this analysis was the Cycle 4 longitudinal weight variable DWTCW01L. This weight was computed using all Cycle 4 respondents to represent the population at the time of the original selection for the survey, which was Cycle 1. For more information about the NLSCY weighting strategy, see section 12 of the Microdata User Guide for the NLSCY, Cycle 4.

Appendix B. Definitions and concepts

Relationship with mother

The purpose of the relationship with mother variable is to provide a measure of how close, affectionate and understanding the respondent perceives his/her relationship with his/her mother to be. Two variables were derived: one for 1998/99 and the other for 2000/01.

Youth were asked to identify the mother that they spend the most time with. This mother could be biological, step, adoptive, foster or other. It is this mother about whom the youth responded to the three questions that were combined to create the relationship with mother score. One percent of respondents did not get a relationship with mother score in 1998/99 because they had replied that they had no mother or were not in touch with their mother, and 1% did not get a relationship with mother score in 2000/01 because they were not in touch with their mother.

The three variables that were combined were:

Overall, how would you describe your relationship with your mother? (CPMCcQ06, DPMCcQ06)
- *... very close*
- *... somewhat close*
- *... not very close*

How well do you think your mother understands you? (CPMCcQ5A, DPMCcQ5A)
- *... a great deal*
- *... some*
- *... very little*

How much affection do you receive from your mother? (CPMCcQ5C, DPMCcQ5C)
- *... a great deal*
- *... some*
- *... very little*

These were selected because together they provide an overall picture of how youth perceived their relationship with their mother[3]. These three items were asked of youth in 1998/99 and 2000/01.

In order to produce the relationship with mother score, the values for the response categories were reversed (*a great deal/very close* changed from a value of 1 to a value of 3; *not very close/very little* changed from a 3 to a 1) and then 1 was subtracted from each item so that the lowest score would be 0. The final score was derived by totalling the values of all items with non-missing values; only those respondents who had responded to all three items had a relationship with mother score. The total score may therefore vary between 0 and 6, a high score indicating a relationship with a high degree of closeness, understanding and affection. The appropriateness of creating a single score from these three items was confirmed by calculating a Cronbach Alpha coefficient[4] in SAS using the normalized survey weight (see Table B1 below).

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3. Mother's fairness was also considered for possible inclusion in the relationship with mother score. This idea was rejected due to the limited variability in responses to this variable in 2000/01. In 2000/01, no one had chosen the third response category thus turning the item into a two-level variable.

4. For more information about the use of a Cronbach Alpha coefficient, see section 9.4 of the Microdata User Guide for the NLSCY, Cycle 4.

The sample was then randomly split into two and a Cronbach's Alpha for each subsample was calculated. As can be seen below, the coefficient remained stable.

Table B1
Relationship with mother score

	N	Cronbach's Alpha (raw)	Item that lowers Cronbach's alpha the most if excluded	Cronbach's Alpha if item is excluded
Original sample				
1998/99	1533	0.78	closeness with mother	0.60
2000/01	1351	0.78	closeness with mother	0.59
Randomly divided sample				
1998/99	779	0.77	closeness with mother	0.59
	754	0.79	closeness with mother	0.61
2000/01	678	0.78	closeness with mother	0.59
	673	0.79	closeness with mother	0.58

Source: Statistics Canada: National Longitudinal Survey of Children and Youth, 1998/99 and 2000/01

This strategy is consistent with how the majority of scale variables in the NLSCY have been derived.

Relationship with father

The purpose of the relationship with father variable is to provide a measure of how close, affectionate and understanding the respondent perceives his/her relationship with his/her father to be. Two variables were derived: one for 1998/99 and the other for 2000/01.

Youth were asked to identify the father that they spend the most time with. This father could be biological, step, adoptive, foster or other. It is this father about whom the youth responded to the three questions that were combined to create the relationship with father score. Five percent of respondents did not get a relationship with father score in 1998/99 because they had replied that they had no father or were not in touch with their father, and 8% did not get a relationship with father score in 2000/01 because they were not in touch with their father.

The three variables that were combined were:

Overall, how would you describe your relationship with your father? (CPMCcQ09, DPMCcQ09)
- *... very close*
- *... somewhat close*
- *... not very close*

How well do you think your father understands you? (CPMCcQ8A, DPMCcQ8A)
- *... a great deal*
- *... some*
- *... very little*

How much affection do you receive from your father? (CPMCcQ8C, DPMCcQ8C)
- *... a great deal*
- *... some*
- *... very little*

These were selected because together they provide an overall picture of how youth perceived their relationship with their father[5]. These three items were asked of youth in 1998/99 and 2000/01.

In order to produce the relationship with father score, the values for the response categories were reversed (*a great deal/very close* changed from a value of 1 to a value of 3; *not very close/very little* changed from a 3 to a 1) and then 1 was subtracted from each item so that the lowest score would be 0. The final score was derived by totalling the values of all items with non-missing values; only those respondents who had responded to all three items had a relationship with father score. The total score may therefore vary between 0 and 6, a high score indicating a relationship with a high degree of closeness, understanding and affection. The appropriateness of creating a single score from these three items was confirmed by calculating a Cronbach Alpha coefficient in SAS using the normalized survey weight (see Table B2). The sample was then randomly split into two and a Cronbach's Alpha for each subsample was calculated. As can be seen in Table B2, the coefficient remained stable.

Table B2
Relationship with father score

	N	Cronbach's Alpha (raw)	Item that lowers Cronbach's alpha the most if excluded	Cronbach's Alpha if item is excluded
Original sample				
1998/99	1450	0.82	closeness with father	0.69
2000/01	1270	0.85	closeness with father	0.72
Randomly divided sample				
1998/99	731	0.82	closeness with father	0.69
	719	0.81	closeness with father	0.70
2000/01	627	0.85	closeness with father	0.71
	643	0.85	closeness with father	0.74

Source: Statistics Canada: National Longitudinal Survey of Children and Youth, 1998/99 and 2000/01

This strategy is consistent with how the majority of scale variables in the NLSCY have been derived.

Friendship score

The purpose of the relationship with friends scale is to measure how well the child feels he/she gets along with his/her peers. This scale has a minimum value of 0 and a maximum value of 16, and was derived in 1998/99 and 2000/01 (CFFCS01, DFFCS01). A score of 0 indicates the respondent does not have a lot of friends and does not have positive relations with other youth. This scale was created using responses to a set of 4 individual items[6]. Respondents were asked

5. Although father's fairness did not suffer from limited variability of responses in either 1998/99 or 2000/01, it was excluded to retain consistency with how both the relationship with father and mother variables were derived.

6. These items are from the Peer relations Subscale from the Marsh Self-Description Questionnaire.

to select *false, mostly false, sometimes true/sometimes false, mostly true,* or *true* with respect to the following statements:

I have many friends. (CFFCQ01, DFFCQ01)
I get along easily with others my age. (CFFCQ02, DFFCQ02)
Others my age want me to be their friend. (CFFCQ03, DFFCQ03)
Most others my age like me. (CFFCQ04, DFFCQ04)

Change in relationships with mother and father and in friendship scores
The three change variables – mother, father and friendship scores - provided a measure of how the perceived relationships may have improved, worsened or stayed the same over the two years from 1998/99 to 2000/01. These three-level variables were derived by comparing the 1998/99 relationship scores to the 2000/01 relationship scores. The relationship had improved if the 2000/01 score was greater than the 1998/99 score. The relationship had worsened if the 2000/01 score was less than the 1998/99 score. And the relationship had stayed the same if the 2000/01 and 1998/99 scores were equal.

Gender and age. Both gender and age were based on variables from the 2000/01 dataset. Gender was based on the male/female variable DMMCQ02, and age was based on variable DMMCQ01 being equal to 16 or 17.

Household income ratio. The household income ratio variables in the 1998/99 and 2000/01 data sets are the ratio of household income to the low-income cut-off (LICO) level as reported by Statistics Canada for the size and location of the child's household (CINHD04A, DINHD04A). The following information on the income ratio variable was taken from the Microdata User Guide of the NLSCY for Cycle 1 (Statistics Canada n.d.a).

> *NLSCY children can be classified as living in households of various income levels. An income ratio has been derived and assigned to each child record and can be used for analytical purposes to further understand the economic situation of the child. The following is a description of how this ratio was calculated.*
>
> *Every year Statistics Canada establishes what are known as the low-income cut-offs, which are derived by considering expenditure to income patterns observed in the most recent Family Expenditure Survey. These thresholds or values are calculated for different urban-size and family-size categories and are updated annually using the Consumer Price Index.*
>
> *The cut-offs that were derived for 1994 were used to calculate the NLSCY* ***income ratio****. The ratio was simply calculated to be the household income divided by the cut-off value (p.63-64).*

Similar procedures were used to calculate the NLSCY income ratios in 1998/99 and 2000/01. Readers who require additional information on data quality issues related to the income ratio are referred to the Microdata User Guide for the NLSCY for Cycle 4 (Statistics Canada n.d.a).

The income ratios in the present report were left as continuous variables. All ratios less than one (i.e. 0.5) indicate income less than the LICO, ratios equal to one indicate income equal to the LICO, and ratios greater than 1 (i.e. 1.5) indicate income above the LICO.

Number of parents in household

These variables are based on the respondents' single parent status in 1998/99 (CDMCD04) and 2000/01 (DDMCD04). A parent can be either biological, step, adoptive or foster. Due to small sample sizes, respondents who did not live with a parent were combined with respondents who lived with a single parent. For each time period, number of parents in the household was analyzed as a two-level variable; two parents in the household, and single parent/no parent.

Stressful events

The purpose of this variable is to sum the number of stressful events youth reported in 2000/01. This variable does not address the frequency or intensity of these stressful events, it only indicates how many were reported. Youth were asked:

> *The following is a series of events that may directly affect youths. Have you personally ever been through any of these events:*
> *...a painful break-up with your boyfriend/girlfriend? (DAMCcQ4A)*
> *...a serious problem in school? (DAMCcQ4B)*
> *...a pregnancy or abortion? (DAMCcQ4C)*
> *...a death of someone close to you? (DAMCcQ4D)*

This variable has a minimum value of 0 (for no events reported) and a maximum of 4. Although four items may seem insufficient to measure stressful events, Table 3 (main text) indicates a positive correlation of 0.31 between this stressful events score and depressive symptoms. This value is highly comparable to most stress-distress correlations reported among youth in which more comprehensive checklists are employed (Avison & McAlpine, 1992).

Table B3 presents the proportion of male and female youth who reported experiencing each stressful event.

Table B3
Stressful events experienced by male and female youth by 2000/01

	All youth		Males		Females	
	%	(S.E.)	%	(S.E.)	%	(S.E.)
Painful break-up	37.0	2.53	30.3	3.47	44.0	3.55
Serious problem at school	28.8	2.52	31.0	3.65	26.6	3.22
Pregnancy or abortion	1.5[E2]	0.43	F		F	
Death of someone close	34.2	2.33	26.6	2.79	42.1	3.53

Notes:
[E2] indicates a CV greater than 25% and less than or equal to 33.3%
F indicates too unreliable to be published
Source: Statistics Canada: National Longitudinal Survey of Children and Youth, 2000/01

Linear regressions ran separately for male and female youth that controlled for demographic characteristics indicated that these stressful events predicted higher depressive symptoms for both male and female youth.

Depressive symptoms scale – 2000/01

The purpose of the depressive symptoms scale is to measure the frequency of depressive symptoms in the public by focussing on the occurrence and severity of symptoms associated with depression during the previous week. This scale is not a diagnostic of clinical depression.

The depression rating scale in 2000/01 includes twelve questions[7], each of which contains four response categories. In order to produce the score, 1 was subtracted from each item so that the lowest score would be 0. The final score (DHTCbS1B) was derived by totalling the values of all items with non-missing values. As well, the answer categories were reversed for questions having a negative loading (DFBCd10F, DFBCd10H, and DFBCd10J).

The total score (DHTCbS1B) may therefore vary between 0 and 36, a high score indicating the presence of depressive symptoms.

Youth were asked:

How often have you felt or behaved in this way during the past week (7 days)?

I did not feel like eating; my appetite was poor. (DFBCd10A)
I felt I could not shake off the blues even with help from my family and friends. (DFBCd10B)
I had trouble keeping my mind on what I was doing. (DFBCd10C)
I felt depressed. (DFBCd10D)
I felt that everything I did was an effort. (DFBCd10E)
I felt hopeful for the future. (DFBCd10F)
My sleep was restless. (DFBCd10G)
I was happy. (DFBCd10H)
I felt lonely. (DFBCd10I)
I enjoyed life. (DFBCd10J)
I had crying spells. (DFBCd10K)
I felt people disliked me. (DFBCd10L)

Response options were: *rarely or none of the time (less than 1 day), some or little of the time (1 to 2 days), occasionally or a moderate amount of the time (3 to 4 days),* and *most or all of the time (5 to 7 days).*

7. The depression scale administered in the NLSCY is a shorter version of the depression rating scale (CES-D), comprising 20 questions, developed by L. S. Radloff of the Epidemiology Study Center of the National Institute of Mental Health in the United States. The rating scale was reduced to 12 questions by Dr. M. Boyle of the Chedoke-McMaster Hospital of McMaster University.

Proxies for depressive symptoms - 1998/99
Two variables were selected to act as proxy for depressive symptoms in 1998/99.

Suicidal thoughts in the past 12 months (CFBCcQ05) was selected because studies have shown a strong relationship between suicidal ideation and depression (de Man & Leduc, 1993). It was analyzed as a two-level variable; had seriously considered suicide or had not seriously considered it.

The second proxy variable selected from 1998/99 was youth's anxiety and emotional disorder score (CFBCS02). Some studies have shown a concurrent relationship between anxiety and depression (Vitaro & Pelletier, 1995) and medical research has shown considerable comorbidity between anxiety and mood disorders such as depression (Bakish, D., 1999; Gorman, J., 1996-97; and Lydiard, R., 1991). The anxiety and emotional disorder scale includes eight questions[8], each of which contains three response categories. In order to produce the score, 1 was subtracted from each item so that the lowest score would be 0. The final score was derived by totalling the values of all items with non-missing values. The total score may therefore vary between 0 and 16, a high score indicating the presence of anxiety.

Youth were asked to select *never or not true*, *sometimes or somewhat true*, or *often or very true* with respect to the following statements:

I am unhappy, sad or depressed (CFBCQ01F)
I am not as happy as other people my age. (CFBCQ01K)
I am too fearful or anxious. (CFBCQ01Q)
I worry a lot. (CFBCQ01V)
I cry a lot. (CFBCQ1CC)
I feel miserable, unhappy, tearful, or distressed. (CFBCQ1II)
I am nervous, high strung or tense. (CFBCQ1MM)
I have trouble enjoying myself. (CFBCQ1RR)

8. The items for the anxiety and emotional disorder scale in the NLSCY came from the Ontario Child Health Study and the Montreal Longitudinal and Experimental Study. For more information about these two studies, see sections B.3.5 and B.4 in the National Longitudinal Survey of Children - Overview of Survey Instruments 1994-95, catalogue no. 89F0078XIE, February 1995.

Appendix C. Data analysis

Coefficient of variation. The coefficient of variation (CV) is a relative measure of variability that can be used to compare the quality of estimates. It is calculated by dividing the square root of the variance of the estimate, by the estimate itself. Note that the square root of the variance is also known as the **standard error**.

Estimates with CVs of 16.5% or lower are considered to be of acceptable quality by Statistics Canada, and can be released without warning. Estimates with CVs in the range of 16.6% to 33.3% are of marginal quality, and should be accompanied with a warning about the relatively high levels of error. Estimates with CVs in excess of 33.3% are considered to be of unacceptable quality by Statistics Canada. Almost all CVs in the present report were in the acceptable range. A few estimates in the marginal range have been flagged in the tables, and those considered unacceptable have been replaced by an 'F' to indicate that they were too unreliable to be published.

Bootstrap weights for variance estimation. The following information was taken from the *Microdata User Guide* of the NLSCY for cycle 4 (Statistics Canada, n.d.b.).

> *It is almost impossible to derive an exact formula to calculate the variance for the NLSCY, due to the complex sample design, non-response adjustments and the post-stratification. A very good way to approximate the true variance is to use the Bootstrap method. A set of 1000 Bootstrap weights is available. Variance calculation using these 1000 Bootstrap weights involves calculating the estimates with each of these 1000 weights and then calculating the variance of these 1000 estimates (p. 136).*

The variances and standard errors of all estimates in the present study were calculated using the bootstrap weights that were developed by Statistics Canada for the 1994 longitudinal sample.

Descriptive statistics. Descriptive statistics were presented on basic demographic characteristics, as well as means and percentages for all other variables. All estimates were calculated using the longitudinal survey weights. For all statistical comparisons of means or percentages – for example, the mean depressive symptoms score for male youth compared to that of female youth – t-tests of the differences in the estimates were conducted to evaluate significance at the $p <= 0.05$ level.

Zero-order correlations were calculated for all the variables of interest. The correlation matrix appears in Table 3 and presents Pearson correlation coefficients. While there was some intercorrelation between the various Time 1 and Time 2 relationship and friendship scores, it was not to the extent that multicollinearity posed a problem for the regression analyses.

Longitudinal analyses. The longitudinal analyses presented in this report involved the use of sequential linear models. The advantage of this method is the ability to assign the order of variables according to theoretical considerations (Tabachnick & Fidell, 2001) – in this case, given the research questions, priority was given to gender and relationship variables and their

link to adolescent depressive symptoms. The remaining variables were loaded in subsequent steps to evaluate not only their predictive power, but the degree to which they affected the predictive power of the gender and relationship variables.

The relationship/friendship variables in the models were scale scores considered to be "latent" variables - i.e. they represented some underlying trait of the individual. Recent research is suggesting that such scores measure the true traits with error, and that this measurement error should be accounted for in the regression analysis. Given that there are not yet widely accepted methods for doing this, this study has not attempted to account for this type of error. Consequently, there may be some bias in the results arising from using the scores as representing the latent variables without error (Croon, 2002).

During the development of the sequential linear models, three data issues were addressed. First, several of the predictor variables and the outcome variable were skewed. As data transformations are recommended when there is a failure of normality or linearity (Tabachnick & Fidell, 2001), these variables were transformed and re-evaluated. The transformation methods included square root, log, or inverse, where appropriate. As the transformations had little impact on the relationships between these variables, and in the interest of interpretability of results, the untransformed variables were used in the regression analyses.

Second, the linearity of the link between the relationship variables and depressive symptoms was investigated in some detail. This was assessed by calculating a mean depressive symptom score for each interval on each of the scales. It was found that the relationship between the 1998/99 relationship variables and depressive symptoms was sufficiently linear so these variables were used in the final analyses.

Third, to determine whether a *scale* or a *categorical* change in relationship variable was more appropriate to the analysis, both types were derived and tested. The categorical change variables were derived as outlined in Appendix B. The scale change variables were derived by subtracting the 1998/99 relationship score from the 2000/01 score. The integer value indicated how much the relationship had changed, while the sign indicated the direction of the change. A positive value indicated that the perceived relationship had improved, while a negative value indicated that the perceived relationship had worsened. A zero value indicated no change. Each type of change variable was tested by loading it into the sequential linear regression models, and both types provided similar results. While the categorical variables did not provide as much information about the change as the scale variables (the 'increase' category combines respondents who increased by 1 or 3 or 4, etc.), they did allow for easily interpretable comparisons of youth who experienced no change with those who experienced a positive or negative change. This was of analytical value to the study, so the categorical were retained in the final analyses.

As the conceptual objective of the analysis was to evaluate the link between youth depressive symptoms and changes in relationships, while taking into account other factors, the final version of each of the regression models retained all variables – significant or not. However, statistical contrasts were conducted to determine whether simpler models gave as adequate explanations of the data as the models with additional variables. In all cases, the set of coefficients of the

additional variables were significantly different from zero ($p <= .05$) and were therefore deemed useful in helping to better explain the data.

Analysis of partial non-response. Only those youth who had complete data for all the variables of interest – referred to as respondents - were included in the analysis presented in the body of this paper. Youth who did not have complete data were considered non-respondents, and excluded. Two distinct groups of non-respondents were identified. The first group included youth who had missing data for at least one of the analytical variables of interest – referred to as partial non-respondents. The second group included youth who did not respond at all in 1998/99 (Cycle 3), but were interviewed in 2000/01 (Cycle 4) – referred to as Cycle 3 non-respondents. This second group of non-respondents was examined separately from the partial non-respondents to determine if being a Cycle 3 non-respondent gave different results.

Due to the relatively high proportion of non-response (53%) several steps were taken to evaluate potential non-response bias as it might relate to the analyses presented in the body of this paper. This kind of bias can occur if non-respondents have significantly different characteristics from respondents. The respondents and non-respondents were compared first on demographic characteristics, then on the 1998/99 and 2000/01 variables of interest. These comparisons were repeated by gender. The respondents and non-respondents were then compared on variables from Cycle 1 (1994/95); variables selected because of their relevance to the research questions. These 1994/95 comparisons were also repeated by gender. All tables are located at the end of the text.

Demographics

Table C1 presents the demographic characteristics of the three groups. There were no statistically significant differences among them with respect to gender. The Cycle 3 non-respondents differed from the respondents and the partial non-respondents in age in 2000/01 (respondents were older). The partial non-respondents differed from the respondents in household income in 1998/99 and 2000/01 (on average, respondents had higher incomes relative to the LICO); and number of parents in the household in 1998/99 and 2000/01 (respondents were more likely to have lived in a two-parent household).

1998/99 and 2000/01 variables of interest

While certain youth were categorized as partial non-respondents (380,800) or Cycle 3 non-respondents (21,800), the amount of item non-response was varied. In other words, while all non-respondents were missing an answer to at least one variable of interest, very few of the non-respondents were missing all answers to all variables of interest. Thus it was possible to compare the respondent and non-respondent groups on key analytical variables in an effort to understand how this varied non-response might have affected results.

Table C2 presents mean scores and percentages for respondents and both groups of non-respondents. A comparison of the partial non-respondents and respondents found one statistically significant difference: a higher proportion of respondents reported that their relationship with their mother was stable, compared to partial non-respondents. Cycle 3 non-

respondents did differ significantly from respondents in 2000/01 depressive symptoms (respondents scored lower), and 2000/01 relationship with mother (respondents scored higher). However, given the small sample size of Cycle 3 non-respondents, it is unlikely that these differences, though statistically significant, represent substantive bias.

Demographics and 1998/99 and 2000/01 variables of interest by gender

To determine if the respondent's gender was related to patterns of non-response, the above analysis was repeated by examining response and partial non-response by gender. Due to their small number, the Cycle 3 non-respondents were excluded from these comparisons. Tables C3 and C4 present the mean scores and percentages by gender. A comparison of the male respondents and male partial non-respondents found no statistically significant differences between them except for number of parents in 1998/99 and 2000/01 (male respondents were more likely to have lived with two parents). Female partial non-respondents differed from female respondents in the number of parents in 1998/99 and 2000/01 (female respondents were more likely to have lived with two parents); the household income in 1998/99 and 2000/01 (on average, female respondents had higher incomes relative to the LICO); and the change in the relationship with their friends from 1998/99 to 2000/01 (a lower proportion of female respondents reported an improvement in the relationship than did female partial non-respondents).

Cycle 1 variables

In a further effort to identify possible non-response bias, several variables from Cycle 1 were examined. This examination was limited to a comparison of respondents and partial non-respondents (see Table C5). This comparison revealed that partial non-respondents differed from respondents with respect to Cycle 1 physical aggression and conduct disorder (respondents scored lower), hyperactivity/inattention (respondents scored lower); and parental rejection (respondents reported lower levels). Respondents were also more likely to report that they got along with their fathers 'very well' than were partial non-respondents.

Cycle 1 variables by gender

When the above comparison was repeated by gender, not many significant differences were found (Table C6). Compared to female partial non-respondents, female respondents scored lower in hyperactivity/inattention, reported less parental rejection, and were more likely to report that they got along 'very well' with their fathers. Male respondents reported less parental rejection, on average, than did male partial non-respondents.

Conclusion

Respondents and partial non-respondents differed significantly with respect to several variables. The effects of non-response also appeared to differ by gender in that, while infrequently, female respondents differed from female partial non-respondents more often than male respondents differed from male partial non-respondents.

While the observed differences were mainly with respect to demographic characteristics, certain emotional and behavioural characteristics from Cycle 1 distinguished partial non-respondents from respondents as well. Given that some research has reported correlation between physical aggression and hyperactivity and depressive symptoms (Vitaro & Pelletier, 1995), and seeing that respondents, in general, scored lower on these scales, it is possible that the sample used in this study could have been slightly less likely to report depressive symptoms in 2000/01. While this must be kept in mind while interpreting the results presented in the body of this paper, it is believed that these differences were not so extensive as to raise serious concern about non-response bias.

Table C1
Means and percentages (standard errors) by demographic category in 1998/99 and 2000/01: respondents and non-respondents

		Respondents			Partial non-respondents			Cycle 3 non-respondents		
		Mean or %	(SE)	Population N	Mean or %	(SE)	Population N	Mean or %	(SE)	Population N
Total				359,600			380,800			21,800
Sex	Male	51.3%	(1.92)	184,400	51.7%	(1.83)	197,000	39.3% [E2]	(11.45)	8,600
	Female	48.7%	(1.92)	175,300	48.3%	(1.83)	183,900	60.7% [E1]	(11.45)	13,200
Cycle 3 (1998/99)[1]										
Household income ratio	mean value	**2.4**	(0.08)	359,600	**2.1**	(0.08)	355,400	..		..
Number of parents	One/other	**14.1%**	(1.76)	50,800	**30.9%**	(2.33)	114,800	..		..
	Two	**85.9%**	(1.76)	308,900	**69.1%**	(2.33)	256,600	..		..
Cycle 4 (2000/01)										
Household income ratio	mean value	**2.8**	(0.13)	359,600	**2.3**	(0.09)	371,200	2.9 [E2]	(0.76)	21,700
Number of parents	One/other	***14.9%***	(1.81)	53,600	**34.9%**	(2.38)	132,900	*39.5%* [E2]	(11.89)	8,600
	Two	***85.1%***	(1.81)	306,000	**65.1%**	(2.38)	248,000	*60.5%* [E1]	(11.89)	13,200
Age	16	*47.9%*	(1.79)	172,100	*51.7%*	(1.67)	196,900	*69.4%*	(8.77)	15,100
	17	*52.1%*	(1.79)	187,500	*48.3%*	(1.67)	184,000	*30.6%* [E2]	(8.77)	6,700

Notes:

[E1] indicates a coefficient of variation (CV) between 16.6% and 25%

[E2] indicates a CV greater than 25% and less than or equal to 33.3%

Bold type indicates statistically significant differences between partial non-respondents and respondents ($p<=0.05$).

Italic type indicates statistically significant differences between Cycle 3 non-respondents and one or both other groups ($p<=0.05$).

All population N have been rounded to the nearest one hundred.

Total sample of 1,855: 908 respondents, 894 partial non-respondents and 53 Cycle 3 non-respondents.

1. By definition, Cycle 3 non-respondents did not respond at all in Cycle 3, so no estimates are available for Cycle 3 variables.

Source: Statistics Canada: National Longitudinal Survey of Children and Youth, 1998/99 and 2000/01

Table C2
Means and percentages (standard errors) of 1998/99 and 2000/01 variables for respondents and non-respondents

		Respondents			Partial non-respondents			Cycle 3 non-respondents			
		Mean	(SE)	Population N	Mean	(SE)	Population N	Mean		(SE)	Population N
Cycle 3 (1998/99)[1]											
Relationship with mother		4.3	(0.08)	359,600	4.1	(0.10)	251,600	..		..	..
Relationship with father		3.7	(0.09)	359,600	3.8	(0.12)	220,900	..		..	..
Friendship score		13.5	(0.13)	359,600	13.3	(0.18)	272,600	..		..	..
Anxiety and emotional disorder		3.8	(0.15)	359,600	3.9	(0.20)	253,600	..		..	..
Cycle 4 (2000/01)											
Relationship with mother		*4.5*	(0.07)	359,600	4.3	(0.12)	190,400	*3.8*		(0.36)	13,300
Relationship with father		3.7	(0.10)	359,600	3.6	(0.14)	149,100	4.1		(0.34)	10,300
Friendship score		13.6	(0.13)	359,600	13.3	(0.19)	196,700	13.8		(0.67)	13,100
Depressive symptoms		*9.0*	(0.31)	359,600	*9.0*	(0.43)	190,900	*14.2*	E1	(2.49)	13,500
Stressful events		1.0	(0.05)	359,600	1.1	(0.07)	186,500	1.4	E2	(0.43)	13,700
		%	(SE)	Population N	%	(SE)	Population N				
Change from 1998/99 to 2000/01[2]											
Relationship with mother	Increased	33.6	(2.36)	120,900	36.1	(4.19)	42,700	..		..	..
	No change	**40.8**	(2.59)	146,600	**30.9**	(3.71)	36,500	..		..	..
	Decreased	25.6	(2.22)	92,200	33.0	(4.14)	39,000	..		..	..
Relationship with father	Increased	34.4	(2.46)	123,600	36.2	(4.57)	27,300	..		..	..
	No change	32.3	(2.38)	116,100	29.8	(4.81)	22,600	..		..	..
	Decreased	33.3	(2.72)	119,900	34.0	(4.31)	25,700	..		..	..
Friendship score	Increased	35.8	(2.52)	128,900	40.1	(4.48)	53,500	..		..	..
	No change	28.7	(2.22)	103,200	23.6	(3.55)	31,600	..		..	..
	Decreased	35.5	(2.34)	127,600	36.3	(4.79)	48,500	..		..	..
Cycle 3 (1998/99)											
Seriously considered committing suicide	No	88.9%	(1.41)	319,800	12.5%	(1.94)	35,100	..		..	..
	Yes	11.1%	(1.41)	39,800	87.5%	(1.94)	246,200	..		..	..

Notes:
E1 indicates a coefficient of variation (CV) between 16.6% and 25%
E2 indicates a CV greater than 25% and less than or equal to 33.3%
Bold type indicates statistically significant differences between partial non-respondents and respondents (p<=0.05)
Italic type indicates statistically significant differences between Cycle 3 non-respondents and one or both other groups (p<=0.05)
All population N have been rounded to the nearest one hundred
1, 2 By definition, Cycle 3 non-respondents did not respond at all in Cycle 3, so no estimates are available for Cycle 3 variables
Source: Statistics Canada, National Longitudinal Survey of Children and Youth, 1998/99 and 2000/01

Table C3
Means and percentages (standard errors) by demographic category in 1998/99 and 2000/01: respondents and partial non-respondents by sex

		Respondents			Partial non-respondents			Respondents			Partial non-respondents		
		Male						Female					
		Mean or %	(SE)	Population N	Mean or %	(SE)	Population N	Mean or %	(SE)	Population N	Mean or %	(SE)	Population N
Total				192,100			205,700			182,400			189,500
Cycle 3 (1998/99)													
Household income ratio	mean value	2.4	(0.11)	184,400	2.2	(0.13)	181,900	**2.5**	(0.12)	175,300	**2.0**	(0.09)	173,500
Number of parents	One/other	**15.0%** [E1]	(2.69)	27,600	**28.4%**	(3.27)	54,800	**13.2%** [E1]	(2.43)	23,100	**33.6%**	(3.16)	60,100
	Two	**85.0%**	(2.69)	156,700	**71.6%**	(3.27)	137,800	**86.8%**	(2.43)	152,200	**66.4%**	(3.16)	118,800
Cycle 4 (2000/01)													
Household income ratio	mean value	2.9	(0.22)	184,400	2.4	(0.16)	194,100	**2.7**	(0.13)	175,300	**2.1**	(0.09)	177,100
Number of parents	One/other	**14.4%** [E1]	(2.65)	26,600	**29.5%**	(3.27)	58,000	**15.4%** [E1]	(2.60)	27,000	**40.7%**	(3.54)	74,800
	Two	**85.6%**	(2.65)	157,800	**70.5%**	(3.27)	138,900	**84.6%**	(2.60)	148,300	**59.3%**	(3.54)	109,000
Age	16	49.9%	(2.75)	92,000	51.1%	(2.56)	100,600	45.7%	(2.50)	80,200	52.4%	(2.39)	96,300
	17	50.1%	(2.75)	92,400	48.9%	(2.56)	96,400	54.3%	(2.50)	95,100	47.7%	(2.39)	87,600

Notes:
[E1] indicates a coefficient of variation (CV) between 16.6% and 25%
Bold type indicates statistically significant differences between male partial non-respondents and male respondents, and between female partial non-respondents and female respondents ($p<=0.05$).
All population N have been rounded to the nearest one hundred.
Sample: 424 male respondents and 468 male partial non-respondents; 484 female respondents and 426 female non-respondents.
Source: Statistics Canada: National Longitudinal Survey of Children and Youth, 1998/99 and 2000/01

Table C4
Means and percentages (standard errors) of 1998/99 and 2000/01 scores for respondents and partial non-respondents, by sex

		Respondents			Partial non-respondents			Respondents			Partial non-respondents		
		Male						Female					
		Mean	(SE)	Population N	Mean	(SE)	Population N	Mean	(SE)	Population N	Mean	(SE)	Population N
Cycle 3 (1998/99)													
Relationship with mother		4.4	(0.12)	184,400	4.3	(0.13)	128,800	4.3	(0.11)	175,300	3.9	(0.15)	122,800
Relationship with father		4.0	(0.13)	184,400	4.1	(0.15)	121,000	3.3	(0.12)	175,300	3.4	(0.18)	99,900
Friendship score		13.1	(0.20)	184,400	13.3	(0.19)	141,700	13.9	(0.15)	175,300	13.3	(0.29)	130,900
Anxiety and emotional disorder		2.9	(0.21)	184,400	3.0	(0.23)	131,700	4.7	(0.21)	175,300	4.8	(0.29)	121,900
Cycle 4 (2000/01)													
Relationship with mother		4.6	(0.10)	184,400	4.5	(0.16)	87,700	4.5	(0.11)	175,300	4.1	(0.18)	102,700
Relationship with father		4.0	(0.14)	184,400	4.0	(0.18)	73,700	3.4	(0.15)	175,300	3.1	(0.20)	75,400
Friendship score		13.6	(0.19)	184,400	13.1	(0.31)	92,900	13.6	(0.18)	175,300	13.5	(0.21)	103,900
Depressive symptoms		8.3	(0.46)	184,400	7.4	(0.60)	86,400	9.9	(0.40)	175,300	10.4	(0.57)	104,500
Stressful events		0.9	(0.06)	184,400	0.9	(0.08)	85,200	1.1	(0.08)	175,300	1.3	(0.09)	101,300
		%	(SE)	Population N	%	(SE)	Population N	%	(SE)	Population N	%	(SE)	Population N
Change from 1998/99 to 2000/01[2]													
Relationship with mother	Increased	35.1	(3.44)	64,700	40.7	(6.30)	20,600	32.0	(3.05)	56,200	32.7 [E1]	(5.78)	22,100
	No change	37.4	(3.61)	68,900	30.1 [E1]	(5.50)	15,200	44.3	(3.37)	77,700	31.4 [E1]	(5.60)	21,300
	Decreased	27.5	(2.98)	50,700	29.2 [E1]	(5.75)	14,700	23.7	(2.89)	41,500	35.9 [E1]	(6.09)	24,300
Relationship with father	Increased	34.8	(3.85)	64,100	35.4 [E1]	(6.73)	13,500	34.0	(3.08)	59,600	36.9 [E1]	(6.14)	13,800
	No change	29.7	(3.37)	54,800	36.7 [E1]	(7.31)	14,000	35.0	(3.47)	61,300	22.9 [E2]	(6.05)	8,600
	Decreased	35.5	(3.91)	65,500	27.9 [E1]	(5.72)	10,700	31.0	(3.48)	54,400	40.2	(6.40)	15,100
Friendship score	Increased	40.7	(3.65)	75,000	35.0 [E1]	(6.19)	21,300	**30.7**	(3.48)	53,900	**44.3**	(6.05)	32,200
	No change	27.8	(3.44)	51,300	18.8 [E2]	(4.91)	11,400	29.6	(2.95)	51,900	27.7 [E1]	(4.75)	20,100
	Decreased	31.5	(3.28)	58,000	46.2 [E1]	(7.74)	28,100	39.7	(3.47)	69,500	28.0 [E1]	(5.37)	20,400
Cycle 3 (1998/99)													
Seriously considered committing suicide	No	93.1	(1.87)	171,600				84.5	(2.16)	148,200	78.9	(3.38)	106,600
	Yes	6.9 [E2]	(1.87)	12,700	F			15.5	(2.16)	27,100	21.1	(3.38)	28,600

Notes

[E1] indicates a coefficient of variation (CV) between 16.6% and 25%

[E2] indicates a CV greater than 25% and less than or equal to 33.3%

F indicates too unreliable to be published

Bold type indicates statistically significant differences between female partial non-respondents and female respondents ($p<=0.05$)

All population N have been rounded to the nearest one hundred

Source: Statistics Canada: National Longitudinal Survey of Children and Youth, 1998/99 and 2000/01

Table C5
Means and percentages (standard errors) of Cycle 1 variables for respondents and partial non-respondents

		Respondents			Partial non-respondents		
		Mean	(SE)	Population N	Mean	(SE)	Population N
Cycle 1 Child reported (1994/95)							
Child anxiety and emotional disorder		3.8	(0.15)	317,200	4.0	(0.16)	304,400
Child physical aggression and conduct disorder		**1.2**	(0.08)	316,800	**1.5**	(0.10)	305,200
Child hyperactivity and inattention		**3.9**	(0.16)	312,200	**4.7**	(0.17)	294,600
Child general self		13.2	(0.14)	359,600	13.1	(0.13)	340,100
Parental nurturance		12.0	(0.15)	315,600	11.8	(0.17)	302,900
Parental rejection		**4.2**	(0.15)	315,000	**4.9**	(0.20)	302,700
Parental monitoring		10.7	(0.14)	312,200	10.6	(0.15)	306,300
Friends scale		12.8	(0.15)	332,300	12.8	(0.14)	335,100
		%	(SE)	Population N	%	(SE)	Population N
Cycle 1 Child reported (1994/95)							
How well got along with mother in past 6 months	Very well	41.5	(2.52)	134,700	37.8	(2.78)	120,900
	Not very well	58.5	(2.52)	189,900	62.2	(2.78)	199,300
How well got along with father in past 6 months	Very well	**46.4**	(2.55)	146,200	**38.9**	(2.85)	111,100
	Not very well	**53.6**	(2.55)	168,900	**61.1**	(2.85)	174,500

Notes:
Bold type indicates statistically significant differences between partial non-respondents and respondents ($p<=0.05$).
All population N have been rounded to the nearest one hundred.
Source: Statistics Canada: National Longitudinal Survey of Children and Youth, 1994/95

Table C6
Means and percentages (standard errors) of Cycle 1 variables for respondents and partial non-respondents by sex

		Respondents			Partial non-respondents			Respondents			Partial non-respondents		
		Male						Female					
		Mean	(SE)	Population N	Mean	(SE)	Population N	Mean	(SE)	Population N	Mean	(SE)	Population N
Cycle 1 Child reported (1994/95)													
Child anxiety and emotional disorder		3.6	(0.21)	160,500	3.8	(0.19)	158,400	4.1	(0.17)	156,600	4.3	(0.27)	146,000
Child physical aggression and conduct disorder		1.6	(0.12)	159,900	1.9	(0.17)	158,500	0.8	(0.09)	156,900	1.0	(0.12)	146,700
Child hyperactivity and inattention		4.3	(0.24)	157,200	4.9	(0.24)	149,900	**3.5**	(0.18)	154,900	**4.5**	(0.24)	144,700
Child general self		13.2	(0.20)	184,400	13.4	(0.17)	170,100	13.3	(0.18)	175,300	12.9	(0.21)	170,100
Parental nurturance		11.8	(0.23)	158,400	11.6	(0.22)	153,200	12.3	(0.19)	157,200	11.9	(0.26)	149,700
Parental rejection		**4.5**	(0.22)	159,200	**5.2**	(0.27)	154,000	**3.9**	(0.21)	155,800	**4.6**	(0.26)	148,700
Parental monitoring		10.7	(0.21)	158,300	10.7	(0.21)	160,100	10.6	(0.19)	153,800	10.5	(0.21)	146,200
Friends scale		12.4	(0.22)	168,400	12.7	(0.20)	176,100	13.2	(0.19)	163,900	12.9	(0.21)	159,000
		%	(SE)	Population N	%	(SE)	Population N	%	(SE)	Population N	%	(SE)	Population N
Cycle 1 Child reported (1994/95)													
How well got along with mother in past 6 months	Very well	39.6	(3.45)	65,700	35.3	(3.99)	58,700	43.5	(3.61)	69,000	40.4	(3.82)	62,200
	Not very well	60.4	(3.45)	100,100	64.7	(3.99)	107,700	56.5	(3.61)	89,800	59.6	(3.82)	91,600
How well got along with father in past 6 months	Very well	41.6	(3.49)	66,200	40.2	(4.05)	60,500	**51.3**	(3.81)	80,000	**37.5**	(3.98)	50,600
	Not very well	58.4	(3.49)	92,900	59.8	(4.05)	89,900	**48.7**	(3.81)	76,000	**62.6**	(3.98)	84,500

Notes:

Bold type indicates statistically significant differences between male partial non-respondents and male respondents, and between female partial non-respondents and female respondents ($p<=0.05$).

All population N have been rounded to the nearest one hundred.

Source: Statistics Canada: National Longitudinal Survey of Children and Youth, 1994/95

Appendix D. Tables

Table D1
Percentage of youth by score on the 1998/99 relationship with mother scale

Score	Percentage	Standard error
0 - 1 (low)	6.8 [EI]	1.28
2	6.6 [EI]	1.17
3	15.3	2.06
4	20.6	1.96
5	19.1	1.82
6 (high)	31.6	2.29

Notes:
Observed range of scores: 0 to 6 (possible range: 0 to 6)
[EI] indicates a coefficient of variation (CV) between 16.6% and 25%
Source: Statistics Canada: National Longitudinal Survey of Children and Youth, 1998/99

Table D2
Percentage of youth by score on the 2000/01 relationship with mother scale

Score	Percentage	Standard error
0 - 1 (low)	4.3 [EI]	0.85
2	4.3 [EI]	0.82
3	16.3	2.01
4	18.7	1.99
5	19.7	1.93
6 (high)	36.7	2.47

Notes:
Observed range of scores: 0 to 6 (possible range: 0 to 6)
[EI] indicates a coefficient of variation (CV) between 16.6% and 25%
Source: Statistics Canada: National Longitudinal Survey of Children and Youth, 2000/01

Table D3
Percentage of youth by score on the 1998/99 relationship with father scale

Score	Percentage	Standard error
0 (low)	7.0 [EI]	1.16
1	7.5 [EI]	1.41
2	6.8	1.09
3	24.7	2.26
4	20.2	2.01
5	13.0	1.86
6 (high)	20.8	2.07

Notes:
Observed range of scores: 0 to 6 (possible range: 0 to 6)
[EI] indicates a coefficient of variation (CV) between 16.6% and 25%
Source: Statistics Canada: National Longitudinal Survey of Children and Youth, 1998/99

Table D4
Percentage of youth by score on the 2000/01 relationship with father scale

Score	Percentage	Standard error
0 (low)	8.9	1.47
1	6.8 [EI]	1.21
2	9.4	1.47
3	19.3	1.96
4	18.0	1.82
5	12.8	1.62
6 (high)	24.8	2.33

Notes:
Observed range of scores: 0 to 6 (possible range: 0 to 6)
[EI] indicates a coefficient of variation (CV) between 16.6% and 25%
Source: Statistics Canada: National Longitudinal Survey of Children and Youth, 2000/01

Table D5
Percentage of youth by score on the 1998/99 friendship scale

Score	Percentage	Standard error
8 and below (low)	3.5 [E1]	0.81
9	2.4 [E2]	0.72
10	7.6 [E1]	1.57
11	7.6 [E1]	1.41
12	8.6 [E1]	1.45
13	13.4	1.68
14	11.2	1.51
15	18.0	2.22
16 (high)	27.7	2.50

Notes:
Observed range of scores: 3 to 16 (possible range: 0 to 16)
[E1] indicates a coefficient of variation (CV) between 16.6% and 25%
[E2] indicates a CV greater than 25% and less than or equal to 33.3%
Source: Statistics Canada: National Longitudinal Survey of Children and Youth, 1998/99

Table D6
Percentage of youth by score on the 2000/01 friendship scale

Score	Percentage	Standard error
8 and below (low)	4.1 [E1]	0.80
9	3.7 [E2]	1.01
10	3.9 [E2]	1.04
11	10.3	1.62
12	9.9	1.60
13	9.8	1.41
14	11.2	1.35
15	11.9	1.68
16 (high)	35.2	2.57

Notes:
Observed range of scores: 2 to 16 (possible range: 0 to 16)
[E1] indicates a coefficient of variation (CV) between 16.6% and 25%
[E2] indicates a CV greater than 25% and less than or equal to 33.3%
Source: Statistics Canada: National Longitudinal Survey of Children and Youth, 2000/01

Table D7 Percentage of youth by number of stressful events reported as ever happened by 2000/01

Number of stressful events	Percentage	Standard error
0 (low)	35.7	2.54
1	35.1	2.38
2	21.8	2.04
3 and over (high)	7.4 [E1]	1.50

Notes:
Observed range of scores: 0 to 4 (possible range: 0 to 4)
[E1] indicates a coefficient of variation (CV) between 16.6% and 25%
Source: Statistics Canada: National Longitudinal Survey of Children and Youth, 2000/01

Table D8 Percentage of youth by score on the 1998/99 anxiety and emotional disorder scale

Score	Percentage	Standard error
0 (low)	14.4	1.97
1	16.4	1.79
2	12.1	1.70
3	10.8	1.60
4	8.4	1.24
5	9.3 [E1]	1.55
6	9.5	1.43
7	7.7 [E1]	1.83
8	3.9	0.78
9	3.1 [E1]	0.78
10 and over (high)	4.5 [E1]	0.93

Notes:
Observed range of scores: 0 to 16 (possible range: 0 to 16)
[E1] indicates a coefficient of variation (CV) between 16.6% and 25%
Source: Statistics Canada: National Longitudinal Survey of Children and Youth, 1998/99

Table D9
Percentage of youth by score on the 2000/01 depressive symptoms scale

Score	Percentage	Standard error
0 (low)	2.7 [E2]	0.82
1	3.3 [E2]	0.94
2	3.4 [E1]	0.81
3	6.4	0.97
4	7.0 [E1]	1.24
5	8.1	1.27
6	13.1 [E1]	2.30
7	6.8	1.12
8	4.5 [E1]	0.90
9	7.3 [E1]	1.51
10	4.5 [E1]	0.86
11	3.1 [E2]	0.87
12	6.1 [E2]	1.70
13	3.0 [E2]	0.90
14	3.8 [E1]	0.89
15	2.9 [E2]	0.86
16 and over (high)	14.2	1.79

Notes:
Observed range of scores: 0 to 34 (possible range: 0 to 36)
[E1] indicates a coefficient of variation (CV) between 16.6% and 25%
[E2] indicates a CV greater than 25% and less than or equal to 33.3%
Source: Statistics Canada: National Longitudinal Survey of Children and Youth, 2000/01